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THE CHINESE CALENDAR: ITS ORIGIN, HISTORY AND CONNECTIONS.

By Thos. W. Kingsmill.

Dr. Legge in his Prolegomena to Vol V. of his great work, *The Chinese Classics*, tells us, *apropos* of previous statements of his regarding the supposed early Calendar of the Chinese :—

"I take this opportunity to touch on another subject which has often perplexed students of ancient Chinese history—the different commencements of the year in the three great ancient dynasties of Hëa, Shang and Chow. According to the representations of the scholars of the Han, and all subsequent dynasties, the beginning of the year was changed to signalise the new dynasty by an exercise of the royal prerogative." He then proceeds to correct an error into which he had fallen through too closely following the later scholiasts in his translation of the *Shu King*, and goes on to say :—

"If I were translating the *Shoo-King* afresh I should feel compelled to cast about for another meaning for the phrase in that passage (三正).[1] In point of fact the *Chuntsëw* seems to shew that the new commencement arose from the necessity of error, which there was not sufficient science to correct."

[1] *Shu*, III. 2. III., 百 扈 氏威侮五行,怠棄三正. There is that chieftain of Hu, he despises the five elements, and takes not the slightest care for the three regulating [terms].

As a matter of fact, our direct sources of information on the ancient calendar of the Chinese, such as it was, are confined to the twenty-sixth chapter of the *Shi ki*, the *Lih shu* 歷書, one of a series of eight antiquarian essays inserted in the *Shi ki*, though bearing strong internal evidence of having been composed by another hand than Sze-ma Ts'ien's. Other accounts have been taken at second-hand from this, and by repeated copying have not only lost in definition, but have picked up a mass of extraneous rubbish for which no authority can be shown.

The *Shi ki* is, however, a work not in favour with the ordinary "teacher," who much prefers to trust to the scholiast, and take from him on trust these glosses. He finds, indeed, a difficulty in grasping the language, and the meaning of the original, often, and especially in this instance, far from clear. Even Dr. Legge did not venture on carrying his chronology beyond 775 B.C., yet it is characteristic of the school to which he belonged that he was content, almost in the same paragraph, to accept not only the so-called Hia, but even to allow a place for the spurious Yin-Shang to be interpolated.

His explanation, that even up to the close of the Cheos there "was not sufficient science to correct" the period of the vernal equinox, otherwise than by the most empiric of formulæ, may be accepted as a statement of fact.

Returning to our authority, the *Lih shu*, it is of interest to discover what its author really did say, and how far it may be made to support the claims of a high antiquity for the Chinese computation of time. It begins, as Chinese essays usually do, with general statements to which little exception can be taken.

"By the ancients the calendar was first established in order to correctly define the beginning of spring. That is

the period when, the ice of winter having melted, insects begin to move, plants to germinate, and grain to put forth shoots. Corresponding with this awakening of nature the year was born in the east, and the seasons followed in regular succession till they closed with the winter solstice. The three cock-crows closed with the daylight; the twelve watches ended with 丑.

"The [motions of the] sun and moon being determined, there succeeded [the investigation of] light. Light indeed was as the senior, darkness the junior; darkness and light were correlated as female and male. Female and male having been evoked, there succeeded the adjustment of the [calendaric] commencement. The sun started on his course towards the west, and light arose in the east; the moon followed in the east and light spread to the west. But the rules [adopted] were not in accordance with the celestial movements, and were misunderstood by men. Thus there was a source of error difficult to correct.

"The sovereigns of the Yih 易 surname received the appointment and felt called on to place affairs on a proper basis, and correctly define the new year. They changed the methods of observation and closely investigated the first principles of the celestial movements, reverently accepting the purpose of Heaven."

So ends the exordium; it does not pretend to be historical, and may be taken for what it is worth as the first crude idea of a Chinese thinker as to the movements of the celestial sphere. The language is excessively involved. The narrative proceeds, and is given as quoted from Sze-ma Ts'ien under his posthumous title of the Historiographer Kung, who, we are told related.

"Shennung was the first to make any attempt [at a calendar]. He was overshadowed by Hwangti, who made a careful study of the movements of the celestial sphere, recognised the five elements, fixed the periods of rest, and introduced the intercalary month. It was at this period that the

ceremonies proper for the worship of heaven, earth and the spiritual hosts, and the classification of material and spiritual essences, were inaugurated. They were called the five media; each had its appointed station and there was no confusion. The common people had faith, the spiritual beings (申 *i.e.* Asuri) had intelligence and ability; people and spirits were perfect in their several spheres; each respected the other without interference. In consequence the spiritual beings condescended to rejoice in the welfare of mortals, and the people enjoyed prosperity and were happy. Evil and misfortune did not trouble them, and they did not fail in their undertakings.

When Shaohao succeeded misfortunes arose; the Kiuli (Kaulai)[2] introduced confusion; the relations of the people

[2] The 九黎 Kaulai (Kiulî); the characters here are entirely phonetic, the allusion being to the Kurus, a tribe of apparently Aryan affinities. However that may be, Kurus certainly crossed into India with the Aryan immigrants. Here they gave their name to the country North of Delhi, the ancient Kurukshetra, the holy land of the Hindus. In the mystic geography of the Vishnu Purana, the Bhadra is made to wash the flanks of the country of the Uttara Kurus (further Kurus) on its way to the Northern Ocean. Ptolemy describes the Kurus as divided into two clans, for we must class as such the Ithaguri (Adhara-Kurus, *lower* Kurus) and the Ottoro-Korræ (Uttara-Kurus, *upper* Kurus) mentioned in his account of Serica (*i.e.* T'sin-kwok); and this position, joined with the identity of the phonetic, makes me associate the Kaulai, with the Kiangs 羌 of the later language. The Kiang lay west of the ancient Chinese in Lungsi. Their capital at a later period received the Chinese name of Ninghya.

According to Indian legend, Kuru, the eponymous ancestor of the Kurus, was a son of Çamvarna, and Çamvarna is but the analogue of Samwei 三危, the home of the 三苗 Sammiao; whither, in the Chinese myth, they were driven by Wushun. The Chinese have always associated the Kiangs and the Sammiao as the forerunners of the Tangutian tribes. In Indian story Çambara was an aboriginal king who lived in an unplaced kingdom called Udavraja, the "country into which the waters flow" which we may compare with the great depression of Lake Lob. He believed himself invulnerable, but Indra discovered him issuing from the mountains, and cut his hosts to pieces, and ruined his cities. [See *The Serica* of *Ptolemy*, Trans. xix., part II., p. 43, *et seq.*]

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and the spirits were embarrassed, and affairs went adrift. Misfortunes of all sorts prevailed, there was no limit to the distress.

Then Chwan hu succeeded to the throne. He appointed Ch'ung[3] as regent of the South to look after the affairs of heaven and regulate the spirits. He appointed also Li[4] as regent of the Fire [star] to look after the affairs of earth and regulate the people. He directed them to restore the ancient usages, and to do away with the wranglings and troubles. To the Kiuli[5] succeeded the Sammiao, who adopted all their evil practices.

These two rulers utterly repudiated their official duties; they made their intercalations at wrong periods, the practices of the first month were neglected, the records of Jupiter's (攝提) periods were not kept, the calendaric calculations were allowed to go adrift.

Yao corrected the backslidings of Ch'ang and Li, not neglecting the ancient usages. He restored the Canon, and appointed Hiho[6] director. He clearly defined the seasons, and corrected the divisions; thus harmonising the *ying* and *yang*, restraining the winds and rain, and reviving the breath of nature. No longer did the people suffer from pestilence. In his old age he resigned in favour of Shun, and presented

[3] *Shu king*, xxvii. 6. 重黎.

[4] 黎 id. C'hungli (improperly divided) is the representative of Indian Agni, the God of Fire. [Mayers' *C.R.M.*, 121.]

[5] We are here on the traces of an old Vishnaivite legend. The Kiuli 九黎 must be identified with the Kurus, the 羌, Kiang, of later Chinese history; the Sammiao 三苗 with Çambara. *See* note [2].

[6] Hiho 羲和. (See *Shu King*, I., 2.). Though there divided Hiho is really the representative of the Indian Garga, the first of astronomers.

him to his distinguished predecessors, saying: "Let the study of [the movements of] the celestial sphere, and the making of the calendar be your special care." Shun in turn delivered over the commission to Yü, charging him to consider it as of the utmost importance to his kingdom.

The Hya ordained that the year should begin with the commencement of the first month; the Yin placed it at the commencement of the twelfth; the Cheo made it begin with the eleventh. Thus under the three dynasties the new year went backwards as in a cycle, and would have eventually returned to its starting-point.

So long as the Tienhya preserved its traditions, it did not lose ground, but when these were forgotten, at the time when it fell into the hands of the minor states, the calendar was neglected. After the time of Yü and Li the house of Cheo declined, and inferior ministers grasped the control of the government. No record was kept of the seasons; the rulers did not publish the calendar, and the agricultural classes grew careless. In the state of Cheo, as amongst the Is and Diks, the prognostications were neglected, and there was no rule to go by. King Siang, in his twenty-sixth year (B.C. 625), intercalated three months, which the *Ch'un ts'iu* condemns.[7] "The rule of the elder sovereigns as to the seasons was that the Li twan 履端 should be at the beginning, so as to determine the succession to the middle, and correct the inequality at the end. With the Li twan at the beginning, even if there be a mistake it may be put right in the middle, and the people be not led astray,

[7] See the *Tsochwan* to Duke Wan (*Ch'un ts'iu*, VI., 1.). The point was as usual missed. In Siang's time the Calendar was so far astray that he had to intercalate *three* months: the commentators misread the paragraph as the *third* month.

and the inequality without trouble be corrected at the end." [8]

After this came the internecine strife of the Chen Kwoh period and continual wars with the frontier tribes. What leisure was there to attend to anything? Tsao alone, 鄄, kept any records of the five movements; the rest, and conspicuously the dependent principalities, were dropping to pieces, and already six had succumbed to Ts'in. Its arms and soldiery were encroaching on all sides, and its influence daily spreading, so that there was neither time nor opportunity to consider anything.

[8] It is evident that up to the time of the compilation of the *Tsochuen* the astronomical knowledge of the Chinese was of the most primitive nature, and the so-called calendar was merely empiric. The King was expected every year to proclaim 告 the seasons and announce the solar terms. The most essential of these was the Li twan 履端, apparently the Lich'un 立春 or commencement of spring of to-day, when the sun is midway in Aquarius. This was always to be the beginning of the year, and by the time they had come to the summer solstice they could check it by observation, so that they might know how much was the error, 邪 *sic*, to be corrected at the winter solstice; when apparently the announcement of the terms for the next year were made. The intercalation of three months at once caused some difficulty in the final adjustment, which was beyond the simple powers of the court astronomers to rectify at once.

Had, as the school of Chuhi would have us believe, records been kept from 2300 B.C., the Chinese must have discovered the precession, which they lay no claim to have done.

The intercalation of three months has however a precedent in Babylonia. Speaking of the intercalary periods in the calendar, F. Lenormant [*Beginnings of History*, p. 256] says:—"Hence the periodic return of years when not one only but two months were intercalated, the *maçru sa addari* after *adder*, and after *ulul* an *ululu sanû*, 'second ulul' (as in the tables of the motions of Venus in *Cuneif. Inscrip. of West Asia*, Vol. III, pl. 63), which we positively know to have been of 30 days, since we possess a hemerology of it. But over and above all these came at intervals far apart years like those of which we find the astrological prognostications in *Cuneif. Inscrip. of West Asia* [Vol. III, pl. 565,] when three months were intercalated, a *nisannu sanû* 'second Nisun;' an *ululu sanû*, 'second ulul;' and a *maçru sa addari*." All this in connection with the cycles of 12 and 120 years, as well as the *soss* of 60 years. It is curious to find that the cycle seems to have borne in Assyria the name of *Karru*, which is phonetically identical with Gr. Καιρός (possibly Κρόνος) and Chinese 更 *kang* (O.C. *kar.*) and it may be Ind, *kâla*,

When however [Shi Hwangti] had gained his five decisive battles, and assumed at Hwoh Shui in person the Imperial Insignia, he ordered the name of the river to be changed to the Tehshui, and at the same time ordered that the New Year should correspond with the tenth month, and that the standard colour should be black. In addition, to adjust the calendar, an intercalation should be made.

Not yet had the true system been discovered.

The Hans after a period came into power, and Kaotsü, the founder of the dynasty, presented the Imperial Sacrifices at the Northern Altar. In the course of the ceremony he addressed those present:—

"I here arise in person, and assume the Imperial Insignia [as was done by my predecessor on the banks] of the Hwoh Shui. It is my intention to clearly define the Calendar and to have drawn up regular tables, so that all may understand the times and seasons, and order be introduced into the empire; and that settled principles being established, our records shall be based on a solid foundation."

[This ceremony took place about the year 202 B.C. The Emperor dying 194 B.C., his son, a minor, succeeded], the Dowager Empress Lü assuming Imperial functions. No opportunity [for revision] presented itself, and the methods of calculating the intervals and defining the standard colour which had been introduced by Shi Hwangti remained in use up to the time of Wen ti [179 B.C.].

Wenti succeeding, a man of Lu, Kung sun, became Prime Minister. He undertook the task of putting on a proper basis the five ruling principles[9] in accordance with the

[9] These five 德 refer to the periods and motions of the five planets; in the Assyrian system, afterwards adopted by the Babylonians, forming the basis of the calendar. *See* note[8] quoted from F. Lenormant.

ancient books. His theory was that to Han appertained the principle of earth.

Therefore [Saturn being the "earth" planet] he was the natural regulator of the periods as well as the director of the commencements and indicator of the standard colour. At the time affairs were prosperous, and the indications of the Hwanglung [geomantic influences] favourable. "Let the minister draw up the scheme. Along with the scheme let him make a study of the pitchpipes and the celestial perturbations."

The attempt however failed and ended in disappointment, and after this the observation of the Hwanglung, the correction of the yearly term, and the draft scheme were abandoned, and the proceedings left unfinished; as well as the regulation of the stellar spaces, and the observations [necessary] for the establishment of the solar terms. He spoke doubtfully as to the business of correctly defining the calendar and fixing the standard colour, which he considered practically impossible. Finding things thus confused, the Emperor Wenti made no further attempt to follow out the Minister's investigations.

At last the time arrived when his present Majesty (Wuti) came to occupy the throne. He summoned the scholars of the Empire to meet at the capital, to consider [the phenomena of] the celestial movements, to take note of the transits and revolutions, to trace out the course of the rotation and correctly calculate the divisions of the ecliptic. By the summer they had assembled, and undertook the reform of the commencements, and the promulgation of the regular periods. At the T'ai shan accordingly the Imperial heralds made the following proclamation:—

"We are informed by our officers appointed for the purpose that up to the present time the received divisions of

the celestial motions have not been correctly stated. These officers have met and deliberated on the steps to be taken to correct the measures of the starry movements, which up till now have not been properly arrived at. From traditions handed down from high antiquity, we learn that, before his death, Hwangti had closely observed and verified the right ascensions, and accurately fixed the musical notation and the pitch of the tones. He had moreover discovered the [occult] relations existing between the planets and the five elements, had established the solar terms, and calculated the astronomical constants. All honour to him! Now the ancient books have been [irretrievably] lost and the harmonies unstrung. We are deeply grieved when we ponder that we have hitherto not been able to define clearly and correctly the daily flight [of time], nor to mark the [hourly] influence of the planet Mercury.

"To-day is auspicious; on it occurs the summer solstice. The *Hwang chung* answers to *Kung*, the *Lin chung* to *Cheng*, the *T'ai chuk* to *Shang;* the *Nanlü* to *Yü*, the *Kûsî* to *Kiok*.[10] We therefore decree, that from this time onward the Solar Terms shall correspond with the New Year commencement, and the musical accords keep time with the Ts'ing,[11] and the names [of the periods] follow in order from the year's beginning.

"When the term 子 (tsze) is reached, the day will correspond with the winter solstice, and the *Yin* and *Yang* [hitherto] irregular unite in the ecliptic. At the beginning of the 11th Moon on the day 甲子 (Kiatsze) will occur the winter solstice, the seventh year of the present term (Yuan

[10] These are the Musical Accords of the Lu Shu, 律書, and are described more fully in note [21]. *See also* Mayers' *Chinese Reader's Manual* [ii], 199, 200.

[11] The vernal equinox, the 清明 of the Almanack.

feng 元封). [We direct that] it shall be the First Year of the Grand Initiation (太初元年) (*i.e.* the beginning of a new epoch).

"The Year title shall be Yenfeng-Sh[ia]p t'i kak,[12] the name of the month Patchü, 畢聚; the day will be Kiatsze, 甲子, and the solstice will happen at midnight.

"Let the calendar be known as the Kiatsze."

[In accordance with these principles, the calendar, which has since that period with slight modifications prevailed in China, commenced in due course on the 24th December, 105 B.C., just fifty-nine years before Julius Cæsar issued in Rome his Julian Calendar, which, with a single change in the 16th Century, has continued to regulate the course of events in Europe. Julius Cæsar owed his calendar to the Greek astronomers of Alexandria, and acknowledged the aid afforded by Sosigenes. The Chinese Emperor, whose scheme was clearly drawn, as will be seen lower down, from the same sources, characteristically omits to mention the real author of the new calendar; and his reticence is followed by Sze-ma Ts'ien and all his successors.

The day was to be the beginning of a new epoch, and Wuti directed that the period just begun should bear the style of the Grand Beginning 太初. Possibly, like his predecessor Prince Cheng, who on assuming the Empire denominated himself simply as the First Hwangti, he intended that the years should for ever follow in ordinal succession. If so his intention soon changed, for we find him, after a bissextile period, altering it to T'ien Han, a practice which he continued to the end of his reign.]

[12] The second part of this name is simply the transcript of the Indian word, B*rih*a(spati-chak)ra, "Cycle of Jupiter." The initial syllables Yenfeng, are formed on the model of the day cycle of 60; their origin is discussed lower down.

Returning, however, to Sze-ma Ts'ien's narrative, he goes on to tell us :—

"The year was the First of T'ai Cho, the title Yen feng Shi[a]p-t'i-kak. The month name Patchü 畢聚; the day happened on Kiatsze, the previous midnight occurred at the Winter Solstice, the position [in the Calippic period] was North. The year contained twelve [lunar] months. There were [at the commencement] no cyclic nor decimal differences" [to be taken into account.]

[It was the Emperor's intention to start fair; solstice, new moon, the commencement of the Calippic period, and of the regular bissextile period of four years, with an intercalary day at the end, marking the initiation of the Grand Beginning. The year was, in fact, to be the Julian year, actually inaugurated in Rome fifty-nine years later, only that the lunar months were to be preserved, strictly subordinated to the solar terms, and the official year was to begin on the day of the winter solstice instead of, as at Rome, at the beginning of March. Sze-ma Ts'ien gives the Calendar for the year as below) :—

Year of Cycle	... ...	... Yen Feng—Shapt'ikak.[13]
Nienhao	... ...	... T'ai Ch'o—First year.
Number of months (lunar)		... Twelve.

[13] The *Chü Kwang*, adds the scholiast, says that the *year branch* was at *Yin* 寅, going *left;* the *year star* (Jupiter) at *Cheo* 丑, going right. The *Soyin* adds, referring to the Calippic period: the period was called the commencement of the P'u (蔀, 76 year cycle) as the 1st of the 11th moon fell on 甲子, moreover the solstice was on 子, and therefore the *commencement* was denominated 北. Now as each year advanced to the end there was found to be an overplus of 4.1 parts, over and above the 12 horary branches, the winter solstice being always four hours late. Thus in a 子 year it occurred at 子, but in a 丑 year it was at 卯, in a 寅 year at 午, and in 辰 at 酉, after a 章, period of 19 years, the commencement being at 酉 and therefore called 酉; and so on through the other two 章—東 and 南. This of course is only parrot-like knowledge; the fact is the Chinese never assimilated the calendar, which remained for them literally "Greek." The *Chengyi* goes on in an endeavour to assimilate the 律 to the Metonic period!

COMPARATIVE TABLE OF CHINESE AND JULIAN CALENDARS.

Year B.C.	CHINESE CALENDAR FROM THE *SHI-KI*.									JULIAN CALENDAR. (Antedated).						
	Nien Haou.	Cyclical Name of Year.	Lunar Year, Cycle Excess.	No. of Days in Lunar Year.	Number of Lunar Months.	Day Decl. of New Moon.	New Year Day, Cyclical Title.	Cycle of Calippus.	Solar Year, Cycle Excess.	Hour-Cycle of Solstice.	New Year's Day, Julian Time.		Mean Length of Lunar Year.	Progressive No. of Days	Julian Bissextile.	Hour of New Moon, New Year Day (Singan).	—
104	太初	焉逢攝提格	54	354	12	·348	甲子戊午壬子丙子辛未乙丑己丑癸未戊寅辛丑丁酉庚申甲寅戊申壬申丁卯辛酉乙酉己戊	北	5	8	B.C. 105	Dec. 24	354.3672	...		11h.50	See Note [15].
103	2	端蒙單閼	48	384	I. 13	·696		2	10	16	104	„ 13	383.8978	354.37	B	20h.42	
102	3	游兆執徐	12	355	12	·603		3	15	24	103	„ 31	354.3672	738.26		18h.04	New Moon at Rome 11h.40.
101	4	彊梧大荒落	7	354	12	·011		4	21	L-Y	102	„ 21	354.3672	1092.63		2h.57	
100	天漢	徒維敦牂	1	384	I. 13	·359		5	26	8	101	„ 10	383.8978	1447.00		11h.50	
99	2	祝犁協洽	25	354	12	·267		6	31	16	100	„ 29	354.3672	1830.90	B	9h.26	
98	3	商橫涒灘	19	355	12	·614		7	36	24	99	„ 17	354.3672	2185.26		18h.04	
97	4	昭陽作噩	14	383	I. 13	·022		8	42	L-Y	98	„ 7	383.8978	2539.63		2h.54	
96	太始	橫艾淹茂	37	356	12	·869		9	47	8	97	„ 25	354.3672	2928.53		23h.33	
95	2	尚章淵獻	33	383	I. 13	·277		10	52	16	96	„ 16	383.8978	3277.90	B	9h.26	
94	3	焉逢困敦	56	354	12	·184		11	57	24	94	Jan. 2	354.3672	3661.79		6h.47	
93	4	端蒙赤奮若	50	354	12	·532		12	3	L-Y	94	Dec. 22	354.3672	4016.16		15h.40	
92	征和	游兆攝提格	44	384	I. 13	·880		13	8	8	93	„ 11	383.8978	4370.53		23h.33	
91	2	彊梧單閼	8	355	12	·787		14	13	16	92	„ 30	354.3672	4754.43	B	22h.09	
90	3	徒維執徐	3	354	12	·195		15	18	24	91	„ 19	354.3672	5108.79		6h.47	
89	4	祝犁大荒落	57	384	I. 13	·543		16	24	L-Y	90	„ 8	383.8978	5463.16		15h.40	
88	後元	商橫敦牂	21	354	12	·450		17	29	8	89	„ 27	354.3672	5847.06		13h.16	
87	2	昭陽汁洽	15	384	I. 13	·798		18	34	16	88	„ 16	383.8978	6201.42	B	21h.54	
86	始元	橫艾涒灘	39	355	12	·705		西	39	24	86	Jan. 3	354.3672	6585.32		19h.26	
				6940							86	Dec. 24		6939.69			

Cyclic difference (over multiple of 60) 大; lunar year ... 54; *i.e.* 354 *days.*
Decimal of day (at New Moon) 小 348; *i.e.* beyond 29 days[14] ?
Cyclic difference (over multiple of 60) 大; solar year ... 5; *i.e.* 365 days.
Hour fraction at Solstice 小 ... 8; *i.e.* $\frac{8}{32} = \frac{1}{4}$ day.
Cycle of Caliphus ... ... N.[15]

I append in tabular form the calendar of the Emperor Wu for the first 19 years, between 104 and 86 B.C. (both inclusive), compared with the Julian system, antedated however 59 years, which will show the practical identity of the two. The essential point of the Julian Calendar was the introduction every fourth year of an extra day, to make up the excess of the year over 365 days. It was assumed that the difference was exactly 8 minims, counting the day at 32, and the only change I have made in the table is in each case in the last column, substituting the initials L-Y for Chinese 無. In the preceding column is given the yearly cyclical excess, agreeing with this, thus: T'ai c'ho, 1, appears as 5 (6 cycles+5), 2, as 10 (12 cycles+10), 3 as 15, (18 cycles+5), but 4 being leap-year, and the year 366 days long, the excess appears as 21 (*i.e.* 24 cycles+21 days). More or less the credit of this innovation has generally been given to Julius Cæsar, but he evidently found it in working order amongst the Greek astronomers at Alexandria; and apparently the only original part of his calendar was the introduction of the extra day by doubling the *sexto calendas Martii* and making it the *bissextus dies.*

With characteristic jealousy the Chinese historians have one and all suppressed all mention of the source whence they

[14] The compiler seems to have mixed up the solar and lunar "differences."
[15] This properly referred to the antecedent year, as 19 is made 丙.

derived the calendar. We, fortunately from other sources, are able to trace the road. About the year 120 B.C., acting on the advice of Chang K'ien, the Emperor Wu determined to open up more frequent intercourse with Bactria (Tahia) and Parthia (Ansik), as well as the adjacent countries. The Tayuan chapter, No. cxxiii of the *Shiki*, gives some account of these missions. [See *Trans. China Branch R.A.S.*, Vol. xiv, p. 1, etc.] Missions, the historian tells us [p. 13], were constantly going and coming between China and the foreign countries to the North-west, to Yuan (Yarkand) and far to the west,—to Arachosia (驕悉) and Ariana (妥然), *i.e.* Herat. Although they did not always "hit it off," still politeness prevailed and the envoys were treated with consideration. They communicated with Wusun and even further west, with Parthia. With Wusun, now Ferghana, relations were so intimate that a Chinese Princess was sent as the bride of the king's grandson. In another page we hear of missions being sent to Parthia, Samarkand, Sarangia and India, some of which consisted of as many as a hundred individuals, many of whom had been regularly trained under Chang K'ien. Every year ten or more parties were despatched, some of them being absent for eight or nine years at a time. Parthia at the time was a powerful kingdom. It had a short time previously utterly defeated Antiochus of Syria, and had taken possession of Mesopotamia. But though Syria was at the feet of her conquerors, the Parthians made no attempt to extinguish it, but on the contrary it became their highest ambition to assimilate its learning and civilization. Ctesiphon, on the left bank of the Tigris opposite the Greek Selencia, became the favourite capital of the Parthian kings, and these openly acknowledged their admiration by adopting on their coins the legend ΦΙΛΕΛΛΗΝ. On the other hand, the two Greek kingdoms of Syria and

Egypt were at this period in close association; and Alexandria and Seleucia became the joint homes of later Greek Science and Literature, where, of the sciences, astronomy was most conspicuously studied.

There is thus no difficulty in explaining the practical identity of the two calendars,—that of Julius Cæsar drawn up by Sosogenes the Alexandrian, and that of Wuti derived directly from Ctesiphon, and both promulgated within the space of sixty years. In both can be recognised the work of the great Hipparchus, the true founder of scientific astronomy, who was certainly alive B.C. 125 or only twenty years before Wuti's proclamation. Hipparchus estimated the length of the tropical year at 365 days, 5 hours $55\frac{1}{4}$ minutes. It would have required 300 years before the difference between this estimate and $365\frac{1}{4}$ days would have amounted to a day, and the astronomers who drew up the Roman and Chinese calendars evidently assumed that this difference could be safely neglected.

Any student of Chinese will recognise the fact that the cycle names given by the Emperor Wu to the years in his calendars are not Chinese, the characters being simply used phonetically. Though the great change from ancient to modern Chinese, which marked the period of the later Cheos, and which culminated during the iron rule of T'sin and the subsequent revolutions, was by the time of Wu practically accomplished, there were still many remains in current speech of the ancient language. The present dialect of the city of Canton is probably the nearest approach to the language of the court of the Emperor Wu. It was only in the year 111 B.C. that the states of Eastern and Southern Yue, Kiangsi, Fuhkien and Kwangtung, were annexed and settled, and the immigrants there as elsewhere carried with them their speech and customs.

Fancy of course then, as now, played a great part in the representation of foreign names by Chinese characters, but one or two rules may be depended on. We can never afford to neglect the consonantal endings of the Juh sheng, and initial Ch never in old Chinese represents a guttural.

Bearing these facts in mind I have made an attempt to place in parallel columns the Chinese "branches," with their recognised connexion with the Zodiacal signs, and the corresponding Greek titles made use of by the Asiatic Greeks under Selencidæ. The latter are taken from F. Lenormant's well-known work, the *Beginnings of History*, London, 1882.

The list it will be seen begins with K'wan tun, representing, according to the Chinese, the constellation Aries, and answering to the Seleucian Χανουν which, however, is held to apply to Capricornus. Shipt'ikak[16] which regularly should follow as the representative of Taurus, and as such answering to Seleucian Σο?αθ (Shebat in Babylonian) is displaced one sign and is made to represent Gemini, thereby confusing Shena(t), Addar, Αδαρ and Che(k) fen yo(k), Ιαραρ; the latter the only one of the twelve irreconcilable with the Chinese form. It will thus be seen that both lines of investigation point to the Greek astronomers of Mesopotamia as the originators of the Chinese calendar, as their compatriots of Alexander were of the Julian.

While, however, we are led to attribute the brand-new Luni-Solar Calendar of the Emperor Wu to the immediate

[16] I have suggested [note [12]] that Shipt'ikak may also represent Brihaspati-Chakra. Shipt'i as representing Jupiter occurs in the abortive scheme of Chwan hu [p. 4]. The ancient name of Jupiter was, however, Hwang fu. See *Shiking*, II. 4, IX. The coincidence is curious, but the Chinese astronomers also applied the name Shipt'ika(k) to Arcturus and the stars in the feet of Bootes; and here it is the representive of the Indian Devaki [as if *Dipdaki*].

Ch.-Year Names.		Zodiacal Signs.	Gr. Babylonian Names.		Zodiacal Signs.	
困敦	K'wan tun ...	Vernal Equinox	Χαισυν ...	Tebit ...	Winter Solstice	
赤奮若	Chi(k) fan yo(k)	Taurus... ...	...	...	...	Ayar represent Taurus Gr. Ιαραρ
攝提格	Shi(ap) t'i ka(k)	Gemini ...	Σοβαθ ...	Shepat ...	Aquarius.	
單閼	Shan a(t) ...	Summer Sols.	Νεισαν ...	Nisân(a)...	Vernal Equinox	
執徐	Chi(ap)sŭ ...	Leo	...	...	...	Addar, Gr. Αδαρ really represents Pisces.
大荒落	Ta fong lok ...	Virgo... ...	(')Εξαρ ...	Sivan(a)...	Gemini.	
敦牂	Tun(t)sang ...	Aut. Equinox	Ταμμους ...	Dûzu ...	Summer Sols.	
協洽	(S)hip (h)ap ...	Scorpio ...	'Αβ ...	Abu ...	Leo.	
涒灘*	T'un dhan ...	Saggitarius ...	Ιουλ ...	Ulul ...	Virgo... ...	ApparentlyIldylorIldhar.
作噩	Tso(k) (ng)o(k)	Winter Sols. ...	'Ατ ...	Tashrit ...	Aut. Equinox.	
淹茂	Immao	Aquarius ...	Θεσιροι ...	Arahshamma	Scorpio.	
大淵獻	Ta un hîn ...	Pisces ...	Τελωμ ...	Kisilif ...	Saggitarius ...	歲hin=南i.e. *nam* or *lam*.

* Also written 芮漢 Yuihan=Dûdhan.

successors of Hipparchus residing in Seleucia or Ctesiphon, we must look to older sources for the form it took; and its evident connection with a primitive cycle of sixty, itself in some measure at least the outcome of an astrological study of the planets Jupiter and Saturn.

Jupiter, especially, seems to have occupied a prominent place in the astrological folk-lore of the primitive settlers in China. In a former paper read before this Society, entitled "A Comparative Table of the Ancient Lunar Asterisms" [*Proceedings*, N.S. Vol. XXVI, p. 44, *et seq.*] I pointed out that the 28 Suk were really a trace of primitive lore having its origin prior to the Aryan dispersal. We find similarly with regard to the cycle of sixty years that it is found in ancient Babylon as the *Soss*, the sixtieth part of the longer unit, the *Saros*, the foundation of the modern time division of the hour, as well as in mathematics of the degrees of the circle. So Jupiter with his year cycle of twelve, which we find in the primitive traditions of nations so far removed as Egypt, Assyria, India and China, was also in the most ancient lore of China a prominent object. An even earlier tradition seems to have divided the Zodiac into ten parts, traces of which may likewise be discovered from Rome to China. I do not propose to enter on this denary cycle, the *Yang*, or male æon, 歲[17], further than to remark that in connection with the duodenary cycle, the *Yin*, or female æon, it afforded the Chinese a simple method of denominating their sexagenary cycle.

The *Yin* cycle of twelve was naturally connected with the division of the ecliptic into the twelve solar signs, or what

[17] 歲 Modern Chinese Sui, to *pass* a *revolution*, hence a *year*, where the phonetic is Wui (*s* being enclitic), is identical with Sanscrit êv-as, a *course*, a *movement* [as of day and night]; Gr. *αἰών* a *space* or *period* of time; Lat. œvum.

came to be their equivalent, the twelve solar months of the year, as well as the twelve original hours of the day, and all these uses, as well as a simple cycle of days, have been in their turn subserved by this cycle commonly known in China as the twelve branches. From the extreme attrition the titles have undergone there is even greater difficulty in arriving at their primitive form than in the case of Sze-ma Ts'ien's year calendar, and this attrition, there are other reasons to believe, may be taken as an indication of hoary antiquity. The original introduction of the arts and civilisation of China was due to the Cheos, an Aryan race, who, driven from their original home on the Upper Oxus by the encroachment of the Turkish hordes from the north, found refuge after long wanderings in the extreme North-west of China some twelve centuries before our era. The so-called earlier dynasties had either no existence or lived elsewhere than in China.

The cult, the family law, and the fundamentals of the language itself are essentially Aryan, and Aryan of a type not essentially different from the settlers in Northern India. Hence the curious fact that the further we trace the traditions of the two countries the more we find them in accord. All history tends to show that the original occupiers of what is now known as Eastern Turkestan were of Aryan descent, and belonged to the Turanian branch of the Iranian family. The name Turan has, by European authors, been wrongly applied to the ancestral stock of the Turkish nomads. It was by no mistake that Selm and Tur were made brothers, sons of Feridun, nor that Afrasiab was made a descendant of the second. The Cheos themselves claimed descent from Kung liu, and Kung liu, whose name restored in the old language was Kereçaspa or Keredaspa, was in turn the descendant of the great Rustam, the renowned hero of ancient Persian story. We have then to ascend no uncertain

nor illegitimate channel in carrying our researches back to their primitive homes; and it is instructive to find the nearest analogue to the 12 brances of the Chinese in the surviving Parsee names of the months. I give a comparative table, showing the connection.

It will be noticed that in the Chinese concept of the Zodiacal relations, the signs are made to run backwards, and this might be supposed to arise from want of knowledge; the explanation is that the sequence is intended to follow Jupiter's retrograde passage in his twelve years' journey round the ecliptic. As a fact, it has been observed, that while many nations have essayed [on paper] to make Jupiter's yearly motion through a sign a time marker, in practice none have ever done so. Jupiter's synodic revolution occupies 378 days, the earth's revolution round the sun 365, and the relations become too complicated for ordinary use. The two hands of a clock coincide 11 times before they finally meet at the starting-point, but no one has ever taken this coincidence as a time measure. But this connection of the *Yin Sui* with the motions of Jupiter seems to indicate an older use of them as a year measure than is usually accepted. Though the cycle of sixty years was placed on a regular footing for the first time by the Emperor Wu, it possibly, or rather probably, was in existence in early times; though it never was taken into official use, and its pretended application to chronology, as Dr. Chalmers has well shown [*Chinese Classics*, V; Prolegomena 99] must be accepted as a mere interpolation.

The influence of Jupiter as the year star is of ancient date, and was recognised equally in Egypt, Assyria, India and China. The earliest mention we have in Chinese of this influence of Jupiter occurs in the *Shi King* [Part II, Book iv. 9]. The Shih yueh chi kiao.

CHINESE AND OLD PERSIAN ZODIACAL NAMES.

Chinese.			Old Iranian.			Corresponding Sign.	
	Modern Name.	Old Sound.	Zeud.	Bundahist.	Cappadocian.	Proper.	By Chinese.
酉	yau	far	Fravashayôdaênayâo.	Fravar*din*.	Artania.	Taurus.	Taurus.
戌	süt	ard	Asha vohîsta.	Ardavahist.	Artaestin.	Gemini.	Aries.
亥	hai	ghar	Haurvatât.	Horvada*d*.	Araiotata.	Cancer.	Pisces.
子	tsze	tar	Tistrya.	Tîr.	Tirix.	Leo.	Aquarius.
丑	ch'eo	dvar	Ameretât.	Amerôdad.	Martata.	Virgo.	Capricornus.
寅	yan	vir	Kshathra vairya.	Shatvairô.	Xanthiri.	Libra.	Sagittarius.
卯	mao	mri	Mithna.	Mitrô.	Mithri.	Scorpio.	Scorpio.
辰	shen	sar*for*çar	Apam napât.	Âvân.	Aponenamami.	Sagittarius.	Libra.
巳	sze	dar	Âtars.	Âtarô.	Arthra.	Capricornus.	Virgo.
午	wu	dvi(sh)	Dadhwao.	Dîn.	Tethusia.	Aquarius.	Leo.
未	wi	(s)vadh	Vohumano.	Vohûman.	Osmonia.	Pisces.	Cancer.
申	shan	sur	Çpento Ârmaita.	Spendarmad.	Sondava.	Aries.	Gemini.

Note.—The Persian and Cappadocian names are from Lenormant. The ancient pronunciation of the last, 申, was *sur*, as 神 =*asura*, Zend *Ahura*. The name was probably thought too holy, and Çpento Ârmaiti (Sacred Wisdom) was substituted by the Zoroastrians.

The sun and moon presage evil,
Abandoning their proper paths;
The four quarters are without rule,
Through leaving their settled course.
That the moon should be extinguished (totally eclipsed)
Is an ordinary matter;
But that the sun should be blotted out,
What [calamity] does it not conceal!
Hwang fu (*Vri*haspati) is Lord of the Ascendant,
Fân wei (Parâçara) Master of Misrule,
Ka pak (Kapuja) looks on complacently;
Chung yun (Çravana)[18] is insubordinate,
Tseo tsze (Savitar?) serves within;
K'wai wei (Javana) spurs his horses,
Yu wei is Captain of the host;
And fair Ts'ai (Dhruva, the Pole-star) twinkles from her fixed abode.

Or again at the beginning of the Chang wu ballad, *Shi*, III. iii. 9.

Shine on in glory!
The King charges his minister,
Nan chung was our distinguished ancestor,
His regent, Hwang fu.

The beginning of this latter ballad is, however, evidently corrupt, and practically untranslatable. The elder name for Jupiter, 皇父 Hwang fu, contains the same phonetic elements as the Indian *Vri*h-as-pati, "Lord of Increase." In this respect it differs from its more modern name Shi(ap) t'i which is simply an attempt to render by Chinese characters the Indian sound. In the one case the two have an identical origin, common to the languages before the Aryan dispersion; in the other the title is but a loan-word introduced from a strange language.

[18] Parâcara is the Indian equivalent of Perseus; as Kapuja is of Cepheus. 仲允 Chung wan is apparently Çravana, the Eagle, and is counted one of the lunar mansions. The names, Greek, Indian and Chinese, seem to antedate the separation.

But if the early Aryan name of the planet has been forgotten in China, as in Europe, his functions as ruler of the year have survived. In Greek and Roman lore Jupiter (Zeus-pater) or Zeus has, from his function of ruling the sky, become the Supreme Lord, the President of the Heavenly Host. Amongst the Semitic peoples he is universally the Just Man, Çedük, so called evidently from his adjusting the calendar, in his twelve years' journey to his starting-point round the ecliptic. Amongst the Hebrews, Çedük was the superintendent of justice ; with the Phenicians, according to Sanchoniathon [Cory's *Ancient Fragments*, 9] he is associated with Misôr and Sydyk (Upright and Just) the discoverers of salt. To Misôr was born Taût, who introduced letters; and to Çedük, the mysterious Cabiri, the inventors of navigation. So in Chinese lore, Jupiter descends as the planet having specially to do with the year, but whose influence is by no means confined to it.

King Siang, we have seen above [p. 6], found the Calendar so far out of reckoning that he had to introduce three intercalary months, and later (B.C. 543) the *Ch'un ts'iu* (Kung Siang) IX. XXVIII. says :—"In his twenty-eighth year, in spring, there was no ice." The *Tsọchuen*, touching this, goes on to explain, according to the received version as translated by Legge, "There being no ice this spring, Tsze Shin said : 'This year there will be famine, it is to be feared, in Sung and Ch'ing. The year- [Star] (Jupiter) [ought to be] in Sing-ke (Sagittarius Capricorn) and it has licentiously advanced into Hëuen-hëaou (Capricorn Aquarius). Hence this ominous character of the season, the *yin* not being able to overcome the *yang*. The Snake is mounted on the Dragon, which contains the stars of Sung and Ch'ing. Those states will have famine. The middle star in Hëuen-hëaou is Hew, but Hëaou denotes consumption and waste. The land

empty, and the people with their resources consumed:—what can this mean but famine.'" This is a sufficiently good translation of the text, as it appears in the accepted edition, which I give at length.

二春愼平宋玄紀時堪龍文虛鄭虛矩
十無曰鄭而歲梠而蓄陽龍星必中名
八冰今其在歲紀星也而壬於玄梠
年梓茲饑星於有不乘鄭宋玄梠土耗
爲

The author of the ancient text wrote anterior to the use of radicals, and could hardly have intended so much nonsense. His transcriber seems to have for some reason altered 壬 into 淫, lascivious, and in consequence had to insert 紀 after 星. The original was plainly 歲在星也, 而壬於玄梠. The sentence read: "In spring (calendaric) of this year there was no ice." The calendar was as we have seen [p. 6] actually three months wrong, and the supposed "spring" had fallen back to August, September, October. The *Tso-chwan* went on to say:—"Tsz'shen said: This year there will be famine in Sung and Ch'eng: the year [branch] is in Sing 星 (cor Hydræ) and the stem (壬) is in Hiünhiao (Equuleus)" (exactly the opposite point of the Heavens). "There will be a time of trouble; the yin (branch) and yang (stem) are opposed; the Snake encroaches on the Dragon. Now the Dragon is the [guardian] star of Sung and Ch'eng, and they must undergo a famine. The Hiünhiao corresponds with the middle of Hü 虛, and Hiao 梠 is but another name for 耗 (ruin). The land will be empty 虛, and the people undone. How can a famine be averted?"[19]

[19] The word-play was unnoticed by Legge, yet the Chinese geomancist, as his fellows all over the world, founded his theory on these verbal coincidences.

In the eighth year of Duke Ch'ao of Lu, the *Tsochwan* tells us how the Marquis of Tsin asked the augur Ch'ao if Ch'en were about to perish. "Not yet," was the reply, "Ch'en belongs to the Chwenhüh clan. The year [star] was in Shunho when [its founder] died, Ch'en is in a like position. Now the [year star] is in Sihmuh, and it will again rise."

In the thirty-second year of Duke Ch'ao we find a more definite statement. The *Tsochwan* tells us: "In the summer Wu attacked Yueh (Cheh Kiang). This was its first hostile encounter, and regarding it the Augur Meh said: "Within forty years Yueh will annex Wu. Yueh has gained the favour of the year [star], and if Wu attack it, it must accept its disfavour!"

There is then considerable reason to believe that the fashion of naming the year from the position of Jupiter existed long before the time of the Emperor Wu. The modern Chinese historians allege indeed that antecedent to the great regulation of the Calendar in the period T'ai Ch'o, the cycle names were never applied to years; but the extracts I have quoted seem to prove that a cycle of twelve, at least, existed, though probably very irregularly kept.

This connects the old Chinese computation of time more closely with the ancient systems of India and Western Asia. Of the similarity I may adduce an example from F. Lenormant [*Beginnings of History*, 259-60]. With the mythology we have here nothing to do. "Hanok, who, as we are told, was deified like Sheth, thus happens, in the essential features of his physiognomy, to bear a remarkable resemblance to the Babylonian Marduk, the "herald of the gods," the special revealer, the common mediator between Êa, Master of supreme Wisdom, and men, he whose planet [Jupiter] watches over the maintenance of Justice in the world, and in that character receives the appellation *Cedeq* from the Jews."

The connection, as well as the differences, between the old Chinese and the old Chaldæo-Babylonian year are well shown in a note appended by F. Lenormant [l.c., note, p. 255]:—"We know positively that the Chaldæo-Babylonians added at frequent intervals a thirteenth month of thirty days to the end of the year, analogous to the *veadar* of the Jews, and called *makru sa addari*, incident to addar. At first it was believed that this frequent intercalation had for its object the correction of the inexactitude of the lunar year, and should be referred to an eight-year cycle analagous to that which Cleostratus of Tenedos introduced amongst the Greeks. But this idea is no longer tenable. On the contrary, now that we know the Chaldean year to have been 360 days long, we are perfectly aware that the intercalation of the *makru sa addari* became necessary every six years to bring it into agreement with the solar revolution, which numbered 365.

As Sayce has correctly perceived, we have here the key to the Chaldean cycle of twelve years, to which Censorinus refers. If the computation of twelve years with two intercalary months, was preferred to six with a single month, it must have been because the character of a celestial apocatastasis was attributed to it ; for Censorinus states that, subsequently to its renewal, atmospheric changes, abundant harvests, famines and distresses recurred in the same order. Now every twelfth year had an essentially apocatastatic character, since not only did it bring the solar year into accord with the civil year, but one of Jupiter's revolutions was then completed (12 years in length) and also the sixth revolution of Mars (2 years) from the beginning of the cycle."

This left an error of a quarter day in the year, which led to the introduction of another intercalary month at the end of 120 years or two *sosses*, "a more important apocatastasis than that of the twelfth year, since Saturn then returned to the

same point in the heavens after four revolutions (of 30 years each), Jupiter after 10, and Mars after 60."

A somewhat similar system prevailed in ancient Persia.[20] Burgess [Translation of the *Sûrya Siddhânta*] describes the Indian year. After mentioning various more or less artificial years, with which we are not concerned, he goes on :— "In all northern India the year is luni-solar ; the month is lunar and is divided into both civil and lunar days, the year is composed of a variable number of months, either twelve or thirteen, beginning always with the lunar month of which the commencement next preceeds the true commencement of the sidereal year." These years are summed up into ages which exceed in absurdity those of the later Chinese. The Golden Age measures 1,728,000 years, the Silver 1,296,000, the Brazen 864,000, and the Iron 432,000. The Great Age thus numbering 4,320,000 years. We, however, find the same numbers figuring in the Chinese rhapsodies. The Indian astronomical system is made to begin with a pretended conjunction in the year B.C. 3102. Like the similar pretended epochs of the Chinese, Fuhhi, B.C. 2852, or Hwangti, B.C. 2697, it bears all the internal evidence of having been calculated backwards from imperfect tables.

But Indian chronology, as Chinese, takes account of a cycle of 60 years, called there likewise the cycle of Jupiter ; and this is what Burgess remarks on it [l.c.] :—

"This is the rule for finding the current year of the cycle of sixty years, which is in use throughout all India, and which is called the cycle of Jupiter ; because the length of its years is measured by the passage of that planet, by its mean motion through one sign of the zodiac. According to the data given in the text of the Siddhânta, the length of Jupiter's

[20] *See* the Bundahist, Chap. xv.

year is 361 days 0h. 38m.; the correction of the *bija* makes it about 12 minutes longer. It was doubtless on account of the near correspondence of this period with the true solar year that it was adopted as a measure of time; but it has not been satisfactorily determined, so far as we are aware, where the cycle originated, or what is its age, or why it was made to consist of sixty years including five whole revolutions of the planet. There was indeed also in use a cycle of twelve of Jupiter's years, or the time of one sidereal revolution. Davis and Watters have treated at some length of the greater cycle, and of the different modes of reckoning and naming its years usual in the different provinces of India."

It will thus be seen that the Indian and the Chinese cycles, though each consisting of 60 and 12 years, are not commensurate, so no more need at the moment be said on the former.

Modern Hindoo astronomy also teaches the twelve zodiacal signs, but they are absolutely derived from the Greek, their titles being literal translations.

Chinese chronology owes little or nothing directly to India, and its coincidences may be accepted as of a date anterior to the Aryan dispersal. Taken in conjunction with the known influence of Indian philosophy on Chinese thought, this circumstance is worthy of note.

Returning, however, to the ancient Chinese attempts to correlate music with astronomy in the evolution of the calendar, our first impulse, on reading the abortive attempts of Kung sun of Lu, is doubtless to smile at the credulity and unpractical nature of these researches. I have already quoted the Emperor Wu's allusions to the musical scale in his proclamation. It is, however, a matter of importance, ethnologically as well as historically, to note that the ancient Chinese shared this idea in common with the most advanced nations of the time; and it is also noticeable that the area

over which this primitive idea prevailed corresponded with the range of the primitive Lunar zodaic of twenty-eight mansions,—from China to the classic lands of Greece and possibly Rome.

The Pythagorean phrase of the "Music of the Spheres" has long e'er this passed into a vulgar proverb; out of which the popular astronomer has often sought to make momentary capital, without knowing or considering that, long before the growth of astronomy as a science, the regular motions of the stars in their celestial orbits had already attracted the notice and rivetted the thought of the early star-gazers of the Nile and the Euphrates. Nor did the idea of the harmony of all nature reflected in the concord of the musical notes end there, for the notion spread east and west, to the dwellers under the skies of Italy, and to the far-off wanderers who sought a settled home along the banks of the Hwangho.[21] Like many others of the ideas handed down in China to the present time we must antedate its origin to the great Aryan dispersal.

[21] THE "MUSIC OF THE SPHERES."

The Chinese have, from the most ancient periods, ever associated the idea of music with that of the celestial spheres. The length of the string or the pitch-pipe necessary to produce certain notes they saw was controlled by certain proportions, and as early as the Hans at least, they seemed to have approached the subject in a somewhat scientific spirit. The *Lu-* (or rather *Lut-*) *Shu*, Chapter XXV of Sze-ma Ts'ien's great work, gives a summary of what was known at the time. Like the contemporary astronomy it bears the stamp of foreign origin, for the Chinese have never adopted its principles, and the diatonic scale is still practically unknown in Chinese music.

According to the Chinese philosophy of the period, the number twelve occupied a commanding station, next to it, and scarcely inferior, being the number sixty. Chang'kien had lately opened up Western Asia (B.C. 126) and the Chinese had availed themselves of the fact to send numerous embassies, who penetrated as far as Syria, and who were instructed to make themselves familiar with the arts and literature of the west. The Chinese

Many writers and thinkers have been content to look upon this beautiful conception as one of the gifts to the world of the Philosopher Pythagoras, whose influence in forming modern thought is even now felt among us. Speaking of the great philosopher, G. H. Lewes tells us, apparently without a suspicion that the idea was even then hoary with the passage of ages:—"The nature of the work (*The History of Philosophy*) forbids any detailed account of the various opinions attributed to Pythagoras on subsidiary points. But we may instance his celebrated theory of the music of the spheres as a good

were already familiar with both numbers, the old nomenclature bearing evident traces of Iranic origin, but the new development was altogether on Babylonish lines. This is not to be wondered at, as Babylon at the time was considered to be the fountain-head of astronomical and astrological lore, the two being as yet undistinguishable.

The predominance of the numbers 12 and 60 formed the basis of development. The year was divided into twelve months. There being however traces both in Chaldea and China of an earlier division into ten, which it will be seen largely influenced, both in Mesopotamia and China, the future progress of events. This influence was however secondary. This division of the year, which must have been originally suggested by the moon, left, however, in Babylon few or no traces of lunar influence. It led to the division of the ecliptic into twelve equal regions, the origin of the Greek system now become universal. But as the sun divided in his annual motion the ecliptic into these twelve equal regions, so it was found that in his daily motion the same marks could be taken for a division of the day, which thus, both in Western Asia and China, came to be divided into twelve hours; each of these twelfths was divided into sixty, making 720 divisions, and these again were computed to be still further sub-divided by 60, making 43,200 seconds. This was apparently the first and simplest system; 60 was called a *soss*, and its square, 60 by 60, a *sâri*.

But astronomical observations brought out a new coincidence. It was found that after twelve years the planet Jupiter occupied practically the same division that he had done at the same month of the year at the beginning of the period. More close observations showed that he was just 4½ days late, but this might at the moment be practically left out of consideration. Each year he was just 33⅓ days coming up to scratch, and

specimen of the deductive method employed by him. Assuming that everything in the great Arrangement (Κόσμος), which he called the world, must be harmoniously arranged, and assuming that the planets were at the same proportionate distances from one another as the divisions of the monochord, he concluded that in passing through the ether they must make a sound, and that this sound would vary according to the diversity of their magnitude, velocity and relative distance. Saturn gave the deepest tone, as being the farthest from the earth; the moon gave the shrillest, as being nearest to the earth."

had dropped behind just one revolution in the twelve years. It was plain that the natural duodecimal count could be extended to years, and that nature had intended also a year cycle of 12.

From this circumstance, as the adjuster of years, the planet Jupiter, or rather his regent, came, in all Semitic cosmogonies, to be the deity presiding over justice, and as such, by the later Jews at least, came to be known as Çüdük or Shedik. But there are numerous traces in the remains left of the ancient cosmogonies which lead us to find this idea underlying all. Sanchoniathon gives a geneology parallel with that of the children of Cain in the Book of Genesis. Of Agros and Agrotes, leaders of husbandry, were descended Amynas and Magus, who taught men to build towns, whose sons in turn were Misor and Sydyk (Mishor and Çüdük, the *upright* and the *just*) who found out the use of salt; while from Sydyk descended the mystic Kabiri of Samothrace, the inventors of iron and the first navigators. Again, according to F. Lenormant, Damascius describes Çüdük as a god, and in this sense he appears on a coin of the city of Berytus, appearing with the eight Kabiri and attended with an ark, referring to the tradition of Noah, the Just (çüdük), and his connection with the flood.

But in the old cosmogony Jupiter appears as the champion of his mother Gê, against his father Kronos, the planet Saturn, or in the old mythology its regent, and after killing him taking his place. Now Kronos, Κρόνος, Assyian Karra, a cycle, is connected with Greek Καίρος (a period of time, a fixed interval, a watch) and this brings it into curious juxtaposition with the identical phonetic in modern Chinese Kang, but in the old language Kâr, apparently also connected with the Sanscrit Kâla, all with like meaning of a period [of time]. Now the correspondence of Saturn with the

Chappell, in his *History of Music*, quotes Diodorus Siculus on this subject. When Hermes, he says, invented the lyre, "he gave it three strings in allusion to the three seasons of the Egyptian year ; for these three strings producing three different sounds, the acute, the grave, and the mean, the acute sound answered to summer, the grave to stormy or wintry season, and the mean to spring," the Egyptians counting only three seasons in their year. So of the Babylonians he quotes Plutarch as saying in his commentary on Plato's *Timæus*, that "the Chaldeans or native philosophers of the

cycle is even more remarkable than that of Jupiter. His synodic revolution occupying a little over 378 days, in thirty years, plus one week, he returns to the same spot in the heavens at a corresponding time of year. As Jupiter occupies twelve in the same journey, the two planets will meet at intervals of 60 years, forming the Hwa Kiatsze of modern China and the Sar of ancient Babylon. The division of the ecliptic into either twelve or seven hundred and twenty parts was probably not found convenient. The year was divided into twelve months of thirty days apiece, and the surplus was made up at the end, it probably seemed reasonable to make a similar division of the great circle into 12 signs of 30 degrees, as suitable for the instruments then in use, and for small quantities the portion of the path covered in a day by the fixed stars was sufficiently near to a degree. The 30 degrees then would moreover tally with the years of Saturn's cycle. The figure 360 lent itself readily to all the other measures. When then the calendar came to be completed, the year consisted of 12 months of thirty days each, with a rest at the end of each year of five days. As it was evident that the excess of quarter of a day would in a short time throw the month out of order, a period of 120 years was selected, at the end of which an intercalary month had to be added to make things square, but as even then the calendar would run in excess three days in each four centuries, another correction not fully explained was apparently provided, possibly a day at each 120 years period.

The other nations do not appear to have adopted this calendar, but to have continued the old lunar months ; though alongside of them also a solar calendar must have grown up to fix the seasons, and regulate the great operations of agriculture.

This was the great problem which was ever before the Chinese, and which, with the means at their disposal they found themselves unable to cope.

Babylonian empire connected sounds with the seasons in the following order:—that spring bore the proportion of a *Diatessaron*, or musical Fourth, to autumn; that of a *Diapente*, or Fifth, to winter; and that of a *Diapason*, or Octave, to winter."

Again, he tells us:—"The Greeks had no names of any sort to distinguish musical notes. They were expressed only by the titles given to the strings of the lyre—"That the Greek [names] are names of strings and not of notes will remove a long-felt difficulty in the language as to the words *Nete* and

Kung sun of Lu seems to have entertained an idea that in the relation of the musical tones he had as it were grasped the solution of the question. Like other primitive nations, the Chinese had founded their music on the pentatonic scale, but someone had discovered the octave and had made out its capability of division into twelve equal intervals, the modern diatonic scale in fact. Further, the lengths of standard pipes capable of giving these notes had been worked out with some approach to accuracy, and a peculiar notation had been arrived at of twelve notes, whereof six were upper (sharp), or male, and six lower (flat), or female. To these notes were given a strange nomenclature, evidencing, however, the un-Chinese origin of the invention. They were: First the Ying-chung 應鐘, "Responsive-bell," answering to the tenth month and the character 亥. Second the Hwang-chung 黃鐘, "Yellow-bell," answering to the eleventh month and the character 子. Third the Ta-lü 大呂, "Great spine," answering to the twelfth month and the character 丑. Fourth was called the "Clan of notables," 泰簇, answering to the first month 正 and the character 寅. Fifth the Kâpchung 夾鐘, "Compressed-bell," answering to the second month and the character 卯. Sixth the Ku-sî, "Ladies' bath," 姑洗, answering to the third month and the character 辰. Seventh the Chunglü 仲呂, "Middle-spine," answering to the fourth month and the character 巳. Eighth the Yuipin 蕤賓, "Delicate guest," corresponding with the fifth month and the character 午. Ninth the 林鐘 Linchung, "Forest bell," corresponding to the sixth month and the character 未. Tenth the I tsak 夷則, "Outland standard," answering to the seventh month and the character 申. Eleventh the Nan lü 南呂, "Southern spine," answering to the eighth month and the character 酉. Twelfth the Wu She 無射, "Unshot arrow," answering to the ninth month and the character 戌.

Hypate, which have seemed to vary from their original senses when applied to music. Although *Hypate* is the lowest string in point of pitch and sound, it is the 'highest' in the Greek sense, which is as to length with any other. It is upon this ground that Nicomachus tells us that the gravest, or lowest, *sound* was ascribed to Saturn from his slow movement, and being farthest from us; 'for,' says he, 'Hypate is the *highest*'; also that Nete, the string of quickest movement and shortest length, producing the highest sound, was ascribed to the Moon, 'which is the *lowest* of the planets and nearest to the earth.'"

But in addition to this attempt to attune the twelve semitones to the twelve lunar months, the Chinese philosopher went further and tried to put them in accord with the lunar zodiac of 28 She, or halting-places. Of course the 28 mansions have, from the beginning, been a trap, and had to give way as soon as any attempt at precision came to be made. The moon really performed her monthly revolution in 27 days, 7 hours and 43½ minutes, so that the paths of no two successive revolutions have more than the roughest approximation. I translate what the *Lut Shu* has to say of the Chung lü, 7th in the above series, which will show how hopeless was the task undertaken by the minister.

"As for the IVth month its medium *lut* is *Chunglü;* it is the natural outcome of matter, and tends westwards. Amongst the twelve "branches" it occupies the place of Sz' 巳. Sz' is the emanation of the male aura; west it reaches to the "Seven Staves" (25th of the Lunar Mansions) the sign is regarded as male, 7 being counted a complete number, and is hence called the Seven Staves. West also it extends to Chang (26th of the Mansions); Chang being denominated the general extender of matter. West also it stretches to Chü (said to be another name for Liu, the Willow, the 24th of the Mansions) in its relation to matter it is the commencement of decay. It belongs to the male aura, as falling water, and is hence called Chü."

The *Lut Shu* goes on with calculations of the numerical functions which are by no means clear. There are apparently the five notes of the pentatonic scale, whose relations are not very evident; these are, 宮 kung, 徵 chïng, 商 shang, 羽 yü, and 角 kioh. Their numbers are given as, Nine times nine, 81—denotes kung: three parts less one, 54—chïng: three

After this sketch of the Greek theories of the connections of music it is both interesting and useful to turn to the contemporary Chinese theories glanced at [*supra*, p. 10]. The Chinese writer, though as usual he does not mention his authority, evidently owes his inspiration to foreign sources, most probably the same whence the new calendar was procured. It is curious to observe how closely the Pathagorean idea is followed.

parts plus one, 72—shang : three parts less one, 48—yü : three parts plus one, 64—Kioh.

The length of the longest pipe, *hwang lung*, is 8.71 inches, and is Kung.
The *ta lü* is in length 7.531 inches.
The *t'ai tsuk* is 7.72 inches, and is kioh.
The *kap chung* is 6.131 inches.
The *ku sê* is 6.74 inches, and is yü.
The *chung lü* is 5.932 inches, and is ching.
The *jui pin* is 5.631 inches.
The *lin chung* is 5.74 inches, and is kioh.
The *i tsak* is 5.432 inches, and is shang.
The *nan lü* is 4.78 inches, and is ching.
The *wu she* is 4.432 inches.
The *ying chung* is 4.232 inches, and is yü.
Then come the numerals of the 12 branches. 子 is unity. 丑 3÷2. 寅 9÷8. 卯 27÷16. 辰 81÷64. 巳 243÷128. 午 729÷512. 未 2,187÷1,824. 申 6,561÷4,096. 酉 19,683÷8,192. 戌 59,049÷32,768. 亥 177,147÷65,536.

Such was part of the task which the minister Kung sun set himself to unravel. It was no wonder that he had to retire ; *re infectâ!* It forms no part of my task to seek to discover the clue. Notwithstanding the labour displayed, it will be readily perceived that the calculations are incorrect.

THE OFFICE OF DISTRICT MAGISTRATE IN CHINA.

By Byron Brenan, C.M.G.

The practical efficacy of the Chinese system of government in promoting the welfare of the people, and preserving the internal peace of the Empire, primarily depends upon that class of officers which are called *chih-hsien*—district magistrate, as we usually designate them. They are in immediate touch with the people, and stand *in loco parentis* towards them. In Chinese official documents they are usually referred to as the father and mother of the people; and this very correctly describes the relationship, for the happiness of the inhabitants of a district depends in a large measure on the disposition of the magistrate; and the effect of the most beneficent measures devised by the Supreme Government will scarcely reach the people if their application is opposed by the local official. The magistrate is the unit of government; he is the backbone of the whole official system; and to ninety per cent. of the population he is *the* Government.

The Chinaman is happiest who never sees an official, who does not even know the name of one. He can ask no kinder fate than that which allows him to pass his uneventful days ignorant of any person more important than the village head man. There are many such, especially in the rural districts; but even amongst those who by reason of their position, of their avocations, or their worldly goods, become aware of the

existence of a constituted authority over them, there are many to whom anything more exalted or powerful than the district magistrate is a vision—a name devoid of any real meaning.

According to the latest edition of the Red Book—an official publication which gives the name of every official in the Empire—there are 1,300 districts in China proper. The province of Chihli has the greatest number, 137; and at the bottom of the list is Kueichow with 34; our own province of Kiangsu has 62.

In his own district the magistrate has various duties to perform which in Western countries are entrusted to separate persons in distinct departments. He is, at one and the same time, civil and criminal judge, collector of taxes, coroner, sheriff, keeper of prisons, overseer of public works, registrar of land, famine commissioner, and officer of education. This surely suggests enough work for one man, whatever his qualifications may be, but the surprising thing is that a district magistrate receives his first appointment possessing absolutely no qualification or previous training; and that nevertheless he manages to acquit himself sufficiently well to remain in office. Naturally he has to put himself entirely in the hands of his staff of trained men, and as their fortune is identified with his, they do their utmost to keep him straight.

I shall now proceed to describe how these officials obtain their appointments. The belief is prevalent that in China office is obtained by competitive examination. This is the theory, and probably the practice held good in olden times, but like most things in the degenerate China of the present day there is a vast difference between theory and practice. A Chinese author puts the case pithily in a sentence which means that "In ancient times officials were scholars, but now there are both officials and scholars." Even in the present

day scholarship is of assistance, but it may be truly said that a very small minority obtain appointments solely through literary proficiency. Literary distinction will give a man a good start, but unless he is prepared to follow this up with money he has little chance of obtaining a substantive appointment.

The first thing a man has to do is to get his name on a list which makes him eligible for a substantive appointment. There are several doors through which the candidate for office may enter. I shall set them out in their order of importance.

1.—*Hanlin san kuan shou chih hsien.*

These are the successful candidates at the final palace examination when scholars obtain the degree of *Chin shih* and are admitted as members of the Hanlin college. The majority of these obtain appointments in some of the metropolitan offices, but a small number receive the rank of district magistrate, and those thus selected are sure to receive employment as district magistrate within two or three months, and this without the expenditure of any money except some small sums as fees to the clerks in the Board of Civil Office. Those, therefore, who can secure a district in this straightforward way may be considered extremely fortunate, but it is seldom that these favoured men get the valuable posts.

2.—After the palace examination above referred to, there is another competition called court examination which is held in the palace,—a theme selected by the Emperor himself being given out for the compositions required. Some of the successful candidates receive the rank or title of magistrate. These do not obtain a substantive post, but they have to proceed to one of the provincial capitals, and there wait until they are selected to fill a vacancy.

3.—Another class is composed of literary graduates who have qualified at a certain examination which occurs once in twelve years. These receive the title of *pa kung sheng* or *yu kung sheng*. Holders of such titles are admitted to a palace examination and, through this test, have a chance of obtaining the rank of magistrate. These must repair to a provincial capital and await employment.

4.—A scholar of the *Chujen*, or M.A. degree, who has three times failed to pass the higher examination may appear before a special commission of selection, and, if he passes, he is eligible for the rank of magistrate. This mode of selection is called *ta tiao chih hsien* 大挑知縣

5.—There are certain scholars who are employed after an examination in copying the essays of the candidates at the metropolitan examination. They are called *Teng lu*. After a certain number of years of this duty they may be recommended for the rank of magistrate; and if the recommendation is successful they have a remote chance of obtaining a substantive post.

6.—In every district there is an officer of education, or director of studies. After he has served a certain number of years in this capacity he may be recommended for the title of magistrate.

7.—A post in a metropolitan office is considered more honourable than a small appointment in the provinces, but for one reason or another a man in a Peking Board holding the degree of *Chin shih*, may prefer to exchange into the provincial service. These may, after a few years of duty in Peking, apply for the rank of magistrate.

8.—Another class is the sons of officials who have died in their country's service, either in some military operations, or by being killed at their post by rebels, or in any duty of a hazardous nature. These are eligible for nomination to the rank of magistrate. Such titles are known as *Nan yung Chih hsien*.

The above list is not exhaustive, but it will serve to show from what ranks the important class of officials we are dealing with is recruited. Any who get into the service in the way described above are said to have come in by the *ching tu*, straight road. There is, furthermore, the purchase system; official rank may be purchased; and those who have purchased rank may eventually obtain office. At the present time no higher rank than magistrate may be purchased; but there have been times when even a *Taotai's* rank could be bought. Those who get into the public service through the purchase system are said to have come in by the side path, *yi tu*.

But so far our man has only got his foot in the stirrup; to get up in the saddle still demands the exercise of much patience and the expenditure of more money. His name is now on the lists kept at the *Li pu*, or Board of Civil Office, and he has to wait until his name is drawn.

As vacancies occur they should be filled by drawing by lot names from some particular list; but there are so many exceptions to this rule that it has ceased to be a rule at all. The intricate system of selection is known only to the clerks of the *Li pu*, who are all powerful in deciding the question of eligibility of candidates; and the eligibility, it may be well understood, is much assisted by the use of money.

Some officers get their appointment direct from Peking, but more frequently they are sent to one of the provincial capitals to await a vacancy. This attitude of expectancy is called *hou pu*; and to many an official this period of *hou pu* must be a painful experience. Debarred by his official status from earning a living in an honest way, his time is chiefly taken up in looking out for vacancies likely to occur, and in scheming and intriguing to get the appointment when it does occur. Many a man never gets beyond the expectant period.

He passes his life in trying to occupy some post, and he goes on expecting until he is past work. In the province of Kiangsu there are about 600 of these expectant magistrates.

These expectant officials, while awaiting a regular appointment, frequently get temporary employment, or *chai shih*. There are many duties to be performed in connection with provincial affairs for which provision has not been made in the regular administration, and in this way there is always employment for a large staff of *wei yuan*, as officers detached for special duty are called. A good many expectant officials thus manage to make a living, and have, moreover, an opportunity of showing that there is something in them, and gaining the approbation of the Governor; and then their chance of getting a vacancy is much improved.

While residing at the provincial capital awaiting an appointment, the expectant who thinks that a prize is within reach looks about him and tries to get some knowledge of official work. In a manual of instructions to magistrates there is a word of advice given to the expectant magistrate. He is, of course, directed to acquaint himself with the conditions of the province; to gain experience by associating with officials of good standing. In his social relations he is advised not to live ostentatiously, or to allow the ladies of his family to make many acquaintances. Particularly is it enjoined on him not to employ local female servants. Family affairs leak out through the gossip of these local domestics. Neither when awaiting employment or after having secured a vacancy is it wise to engage as female servants any natives of the place. It is better to bring women from our own provinces as then they will not become intimate with the people of the town. Female influence is often felt in the yamen, and the ear of the magistrate may be reached through the female servants and the ladies of the family. That persons desiring

favours may find the shortest cut through the women's apartments is recognised in the popular saying "that when the ladies are pleased, and the female servants are content, then you may know that the real master is not the magistrate."

When at last the expectant magistrate is appointed to a vacancy the appointment is officially gazetted at the yamen of the Provincial Treasurer. The nomination is posted upon the notice board at the gate of the Treasurer's yamen, for all such appointments are supposed to be made by the Treasurer. In reality the latter is merely recording a decision already come to by the Governor of the province. In former times the *Fantai* or treasurer was the highest provincial official, but about four centuries ago it became customary to send high officers as inspectors to the provinces; and these gradually extended their stay, and developed into permanent governors. The title *Hsün fu* indicates that originally this high officer went on circuit.

The newly appointed official chooses a lucky day for starting on his journey. The day is fixed by a fortune-teller who professes to discover some connecting link between the man's horoscope and the ceremony of taking a seal of office.

Before quitting the provincial capital he takes leave of all his superior officers, and particularly tenders thanks for his appointment to the Governor and the Provincial Treasurer. The permanent staff of the province to which he is proceeding has already come to the capital to fetch their new master and convey him to his destination. All preparations have already been made by them, such as hiring boats or carts and preparing lodgings on the road, for all of which he will have to pay by-and-bye.

On reaching the end of his journey he is lodged in temporary quarters until his predecessor has vacated the official residence. The new magistrate on taking over office

—or receiving the seal as it is called—goes through a very elaborate ceremony, of which the following is an outline:—The outgoing official hands over the seal to his successor, who causes it to be put on a table decorated with the Imperial Yellow, and forthwith performs the ceremony of *kotow* nine times, and then thanks the Emperor for having conferred the post. In some yamens there is a small shrine where the magistrate also goes through a ceremony, but this is a matter of local custom and is not part of the official programme.

When all this *kotowing* is over, the magistrate takes his place on the official seat in the middle of the intermediate door of the yamen, and the staff of the establishment come forward and do their *kotowing*, the magistrate meantime standing aside and acknowledging the salutation by bowing. He then retires into the guest-hall inside the yamen, where he receives the congratulations of his secretaries and of his relations, when *kotows* are mutually exchanged. After this he retires into the inner apartments, where the female portion of the family also do their prostrations. If the new magistrate has brought his father or mother, he prostrates himself before them. All this time he has been in his court robes, but now he is at liberty to remove them and put on plain clothes.

Now we have the magistrate installed in office. His first duty is to issue a notification announcing that he has taken up his duties. On this auspicious occasion the document is written on red paper. He then proceeds to publish a proclamation informing his subordinates that he will not tolerate any abuses and inviting the people to report to him immediately any attempt at extortion. Then, on an early day, he proceeds to the city temple and makes a bow before the guardian deity,—a ceremony that may be compared with taking the oath of office with us. The magistrate's oath is as follows: "You the presiding deity are intelligent and

far-seeing. You afford protection to the people and bring prosperity to the district. My abilities are but limited, but now that I have assumed office all my actions shall be in the light of day. Old established customs which are not injurious to the people I shall leave unchanged. May I be struck dead if I accept the smallest bribe, or take even one bowl of rice from the people; or allow my runners to extort money; or fail to deal promptly with any case brought before me; or allow innocent persons to be falsely accused. So do I humbly make my vow and publish my intentions; and I call upon you to witness that I pledge myself to fulfil them."

The multifarious duties which claim the attention of a district magistrate, and for the due discharge of which he alone is held responsible, are far beyond the power of one man. There is scarcely any matter occurring in the district in which he may not be called upon to take action. Everything, from an inundation to a street brawl, may claim the attention of this many-sided individual; and while those entrusted to his keeping frequently fail to appreciate the attention he would bestow on them, there are times when the same people look to him for assistance in circumstances absolutely beyond his control. To their thinking, it is the magistrate's duty to control the seasons and to restrain the forces of nature; and if anything goes wrong, the people resignedly submit to their fate, comforted by the reflection that it is all the magistrate's fault.

To discharge all the duties that are imposed on him a magistrate must have a numerous staff.

The strength of the staff of a district magistrate must of course vary with the importance of the post, and here it may be explained that districts are classified under certain denominations. The four words *Chung fan pi nan*—meaning frequented, troublesome, wearisome, and difficult—are used to designate a

very important post. The very important posts have the four characters prefixed; and they are called four-character posts, others have three, two, one, or none. The Shanghai district has three characters; and in this yamen there may be as many as 200 men of all ranks employed. A small unimportant post would have 20 or 30 only.

In every *Chih hsien's* yamen a complete staff would include the following persons:—First, there are the *Mou Yu*, whose Chinese titles indicate that they are individuals in intimate official relationship with the incumbent of the post. The most important on the staff are two, the *Hsing ming shih yeh*, or law secretary, and *Chien ku shih yeh*, or revenue secretary. These men are nearly always from the Chekiang province, and usually come from Shaoshingfu. A secretary in a yamen has always some pupils or articled clerks with him, and these in course of time are recommended for employment to magistrates or other officials in want of secretaries. In this way the office of secretary in all yamens has almost become a monopoly of the Chekiang province, and it is as much in the natural order of things for a yamen secretary to be a Chekiang man as for a banker to be a native of Shansi. The magistrate is entirely in the hands of his legal and financial advisers in their respective departments. He goes to his first post utterly ignorant of the duties he will have to perform; and, to an extent which could find no parallel in our own services, he is merely a responsible figurehead at the mercy of his trained subordinates.

The next in importance is the accountant, who has charge of the moneys passing in or out. Another important individual is the *Shu chi*, or private secretary, who drafts all despatches, reports and other official documents. Then comes the *Cheng shou*, or tax collector.

There are furthermore two clerks who see that official documents are properly prepared and finished. They are known as the black ink and red ink clerks. The red ink man adds the circles and flourishes in red ink which we see on all official documents. Then comes a string of clerks whose duties may be inferred from their titles: there is the *Kao an*, clerk in charge of correspondence; the *Chien tsao*, clerk in charge of revenue returns; the *Chien kao*, clerk who registers documents; the *Chih tieh*, clerk who receives the petitions; and the *Tsa wu*, clerk who does whatever is left over by the others. He is a sort of general utility man, if room there is for one in such an overstocked yamen. There is also the *Chih tang*, or usher of the police court; *Men chai*, the yamen attendants at the gate; and a host of assistants to all the above. All these I have enumerated change with each new incumbent, but occasionally an incoming magistrate may take on one or more if he does not happen to be already suited, or if, for local reasons, the outgoing official particularly advises him to do so.

The permanent clerks—those who remain through all changes, and are part and parcel of the yamen establishment—are the *Shu pan*, or clerks in charge of the six divisions of a yamen. These divisions are called *fang*, and in their small way they correspond to the Six Boards in Peking; and the names by which they are known are the same as those of the Six Boards—*Li*, *Hu*, *Li*, *Peng*, *Hsing*, *Kung*. There are besides two more divisions, the *Chen fa fang* and the *Chao kao fang*; their duties are the sending out and the receiving of official documents. And yet two more departments have to be mentioned, the *Tsung tsao fang*, in charge of the grain tax, and the *Tsung yin fang*, in charge of the land tax.

The yamen lictors, runners, and constables come at the end of the long list; they are called *Tsao pan*, *Kwai pan* and *Pu pan* respectively. All these, from the *Shu pan* down to

the constables, are a permanent fixture; the office is hereditary in certain families, and their vested interests are so firmly established that they are known as yamen aborigines; and it would be almost impossible to dislodge them.

Now to describe the various duties which a magistrate has to perform.

The most important, and that to which he has to devote the greatest care, is the judicial office. The yamen of a magistrate is a court of first instance in all cases, civil or criminal, for by Chinese law it is forbidden under a penalty of 50 blows to make application to a prefect or higher official until the case has been submitted to the magistrate; and similarly the subordinate officials in a district, such as the assistant or sub-magistrate, are required to refer all cases to their superior officer as soon as they are brought to their notice. These latter do, as a matter of fact, deal with minor offences on their own responsibility, and take cognizance of many matters which should strictly go before the magistrate; but the work of the district could not be carried on unless this was done, and the magistrate is very willing to wink at this usurping of his authority.

To assist him in the discharge of these duties every magistrate has, as I have already stated, an experienced law secretary who has the criminal code at his fingers' ends. As all important cases are liable to be taken on appeal to a higher court, great care has to be taken that all proceedings are regular, or at any rate that they will appear so in the record of the case that is prepared for future reference. The first consideration is to pay studious regard to the *Taching lü li*, or criminal code of the dynasty. The magistrate has this always in mind. There are many published works to which he may look for guidance, such as "Instructions to judicial officers," "Leading cases in criminal law," etc., and in these he will

find instructions in almost any case that may arise. For example, if it is a case of gambling: the magistrate refers to the proper book, turns up the right page, and finds that he has to enquire who it was that first proposed gambling; how many associates were there; who produced the implements; how much money did each person have; then, when the guilty parties have been convicted, the gambling apparatus must be destroyed in open court.

If the offence is that of unlawfully slaying cattle for food, the magistrate must ask where the cow came from; was it diseased; who cut up the carcase; and did the neighbours object, etc.

There are also books which record the decisions of famous judges—a sort of collection of judgments of Solomon. Here are a few of them.

Two men were disputing about the possession of a fowl. The judge inquired of each what he fed his fowls on. One said barley and the other said beans. When the fowl's crop was opened barley was found, so the bean man was punished.

Two men were quarrelling about a piece of silk. The judge ordered the silk to be cut in two, and gave half to each man, and sent them out. Then he secretly sent a man outside to see how they took his decision. One man looked pleased and the other looked discontented. This was enough for the judge, who ordered both pieces to be given to the discontented man.

An old widow Chang was living with her rich son. One day an old man came and claimed that he was really his own son, whom as an infant he had given away to a certain Chang. The old man's intention was to fasten himself on the rich family. The case came before the magistrate, who asked the old man for proof that he had given away his son. Nothing daunted, the old impostor produced a book where on the fly-

leaf was an entry as follows: "On such-and-such a day I gave my infant son to old father Chang." This looked conclusive, but the magistrate, turning to the widow, asked, "How old was your husband when he died last year?" "Just 60," she replied. "And how old is your son now"? "31," was the answer. "That would then have made your husband 30 years old at the time he is said to have taken the child," remarked the magistrate. Then, turning to the old man, he said, "How is it you wrote that you gave your child to old father Chang, if he was only 30." The impostor looked confused, and was duly punished.

The underlings and hangers-on of a yamen live on litigation, and they work hand-in-hand with a class of men known as *Sung kun*, professional stirrers-up of strife. They are ever on the look-out for opportunities of creating litigation; and, being good judges of human nature, they know how to fan a spark into a flame, and out of a small dispute between rich persons to work up an intricate law suit in which both plaintiff and defendant will be ruined. In their instructions magistrates are specially directed to suppress these pests, and to exhort the people to compose their differences without having recourse to law. These *Sung kun* attorneys soon discover the weak side of a magistrate. If he is down on gambling they trump up charges against wealthy persons; if the magistrate is much interested in irrigation they work up a case against some rich proprietor who is accused of diverting the streams, etc. There is a more reputable class of men who act as attorneys. These men have a semi-official status, and are appointed by each successive magistrate. Before appointment they undergo an examination which tests their ability in drawing up official documents. These men are known as *tai shu*. They are required to satisfy themselves that their client is the person he represents himself to be; and that if several persons join in an action that they are all aware

of the contents of the petition. The attorney may not do more than note down the facts as stated to him, and draw up the petition in proper form. If a woman comes with a complaint the attorney must ascertain whether she has a husband or a son who may appear in her stead. It is only when a woman has suffered a personal wrong that she may present a petition in person. These attorneys may only prepare documents for their clients; they are not allowed to appear in court to plead.

The fee charged for preparing a document varies with the importance of the case and the wealth of the litigant. In important yamens these *tai shu* make several hundred dollars a month.

Petitions on ordinary matters are received on certain days of the month, and an illegal fee has to be paid to the yamen underling before it is handed in. Cases have come to my knowledge in Canton where a plaintiff has had to pay $50 before his petition could be put before the magistrate. This is one reason why Consuls are so often requested to transmit a petition in some matter wholly unconnected with foreign interests. I have frequently been requested to do this, and have been assured at the same time that I would not again be troubled in the matter; once the petition was in, the petitioner felt sure of obtaining a hearing and perhaps justice. There are certain cases where a petitioner may obtain a hearing at once without waiting for the regular day when the court sits. Outside the main entrance of the yamen there is hung a gong, or there ought to be one, and when that gong is struck the magistrate is supposed to appear at once. The gong may only be struck on the occurrence of certain events which are enumerated on a board over the gong. The occasions for appealing by striking the gong are when it is desired to announce—

1.—That a secret society is plotting mischief.
2.—That the police are making illegal arrests.
3.—That the police are detaining someone secretly.
4.—That the police are unlawfully removing goods.
5.—That a murder has been committed.
6.—That a highway robbery has been committed.
7.—To give in charge conspirators or violent beggars.

It is a magistrate's duty to clear off cases which are on the hearing list as expeditiously as possible. Even in civil cases the defendant is often kept in custody for months before the case comes on for hearing; and the delay is frequently the fault of the plaintiff, who by this means hopes to force the other side to come to a satisfactory agreement.

In such cases the magistrate should fix a date, and have notice served on the plaintiff warning him that if he does not appear with his witnesses at the time fixed the case will be struck off the list. It happens, however, that the defendant who is in custody will bribe the yamen runners not to serve the notice on the plaintiff, who will thus fail to appear and will lose his case. To guard against this a magistrate, in addition to giving personal notice, must have the notice publicly exhibited near the man's residence. When investigating serious cases, such as highway robbery or murder, the magistrate is instructed to examine the accused and the different witnesses separately. Witnesses know how wrathful a magistrate becomes when the evidence is contradictory; so if they have the chance they will all tell the same story in the same words. It is therefore a better plan to keep all the witnesses apart; and then, if after this precaution the testimony of all agrees, the magistrate may feel sure that he has the right story.

The instructions to magistrates also suggests a way of getting at the truth when two or three men stand accused of

a crime, and there is but little evidence against them. It is not quite in accord with our principles of jurisprudence, but a Chinese magistrate's motto is "a confession at any price." When two or three criminals are being tried the magistrate should hold the trial in a room where a trustworthy clerk has previously concealed himself in a cupboard or under a table. The magistrate should proceed with the case for a time, and then by pre-arrangement a servant comes in and announces that some important visitor has arrived. The judge adjourns the trial for a short time, and orders the door of the room to be locked. Left alone, the prisoners are sure to talk about the crime, and of their chances of an acquittal. They will of course be overheard by the concealed person; and then, as the Book of Instructions says, the evidence against them will be complete.

One curious piece of advice is given to magistrates as to their demeanour when dealing with offences which they wish particularly to put down. It order to strike terror in the hearts of evil-doers they must simulate uncontrollable anger. They should strike the table and shout aloud, and make believe that their patience is quite at an end. They should stand up and make pretence of leaving the hall, as if the heinousness of the crime was too much for them. The criminal must be made to feel that no penalty contained in the criminal code will meet the requirements of the case, and that something exceptionally severe must be invented for the occasion. Then, after the judge has worked himself up to boiling point, he must with a great effort bring himself to give the criminal one more chance, and resume his seat on the bench. Evil-doers will then realize that they have no ordinary man to deal with, and be terrorised into mending their ways.

A considerable portion of a magistrate's emoluments comes from fees paid by litigants. These are considered

illegal; but it would not benefit the litigants even if some strait-laced magistrate refused to accept them. The only result would be that his staff would keep the whole amount, instead of halving the fees with the magistrate, as is now customary. Besides judicial fees, the magistrate receives presents from those within his jurisdiction; some of these he is at liberty to accept; others are looked upon as illegal, but they are accepted all the same. The broad rule laid down is that anything that comes directly from the people, or is offered in connection with litigation, is illegal; but presents from firms or associations, offered merely out of courtesy and respect, may be accepted. An unusually clean-handed official may sometimes decide to abolish a time-honoured fee or present; in such a case he is recommended not to take his yamen staff into his confidence, else they will go to the parties, and offer for a consideration to get the fee abolished; and thus the people will be misled into paying money for a relief which the magistrate was prepared to afford them for nothing. The term for these presents is *lou kuei*, which implies that there is something disgraceful in accepting them, but the disgrace is so universally shared that nobody is the worse for it. The regulation salary of a magistrate is 200 taels a year, with a further allowance of between 1,000 and 2,000 taels a year as an encouragement to honest administration. As a matter of fact he never handles one or the other. His emoluments are retained by the provincial treasurer to meet defalcations in the magistrate's accounts or to pay fines inflicted for some official offence; and when the settling-day comes the salary is always withheld.

A magistrate has occasionally to intervene in very delicate questions. His yamen is not exactly a divorce court, or a court for matrimonial causes; but he may be called upon to decide questions akin to these, and even actions for breach of promise

may occupy his attention. In this respect he possesses greater authority than our judges in England, for whereas the latter, with the assistance of a jury, can only fix the amount of money which the faithless defendant shall pay to the disappointed plaintiff, in China the judge may go so far as to decide that the grounds on which one of the parties wishes to throw over the other are insufficient, and to rule that the marriage shall take place. When a betrothal has been properly arranged through the agency of the matrimonial agents, or when presents have been sent to the girl and these have been accepted, the proof of the betrothal is clear enough, and it is difficult to back out of it. But there are times when, over a cup of wine, the fathers of two young persons settle that their children shall marry when they attain the proper age, and there is no further evidence of the contract. In such a case the Chinese say that a cup of wine took the place of the go-between. In the absence of evidence, the parents on one side or the other may think it safe to back out of the affair and a law-suit is the result. In such a case the magistrate's duty is to find out what is the cause of the rupture. The reason usually is that subsequently to the engagement, which may have been made years before, the man has become poor or the girl has become deformed or very unattractive. The magistrate should have the couple brought before him, and interrogate them himself, and not allow their views to be influenced by others. If they say they do not wish to marry, then, rather than force on them a life of unhappiness, the magistrate decrees a separation. If they are willing to marry, then he orders them to marry, and thus conform to the earlier wishes of their parents. But if the reason for the rupture was that the woman is unattractive, it behoves the bridegroom to give her face by carrying out the ceremony with much publicity—full choral service, as we should say; and if the

reason was that the man was poor, it is proper for the bride to contribute an extra amount of things to the *ménage*.

But where go-betweens have been employed, or when presents have passed, then subsequent loss of fortune or of attractiveness cannot be taken into account. A bargain is a bargain, and there is no question of the parties being willing or unwilling to marry.

I shall cite one of the cases which are quoted as precedents for the guidance of magistrates. A man named Chao promised his young daughter in marriage to a man named Chen, and accepted 64 taels as sealing the contract. Without waiting until he was married, Chen took a concubine and got children. The man Chao then took offence, and objected to his daughter going to the man as a second choice. Still, in the face of the contract, he did not venture to give the girl in marriage to anyone else. Chen meantime let matters be, and showed no sign of claiming his bride. So things went on until the daughter reached the age of 30. At last, in despair, Chao gave his daughter in marriage to another man. Then Chen began to make trouble against Chao; but mutual friends interfered, and peace was made over a dinner, one of the conditions being that Chao should return the 64 taels he had received and that Chen should sign a document renouncing his claim to the daughter. After some time Chen began to think he might extort more money out of Chao, and he brought an action against him before the magistrate. The judgment was to the effect that Chen had made light of the state of marriage by taking unto himself a concubine *before* he was lawfully married; moreover he had shown disregard for the parents' feelings when he ignored his *fiancée* until she was 30 years old. Besides, he had taken back the 64 taels paid by him to the girl's parents, and had signed a document renouncing all claim to the woman. It was very evident

then that it was not the bride but more money that he was seeking to obtain.

On the part of Chao, he too had been in error in giving his daughter away to another man before publicly announcing to the officials and the relations that the former contract was off. The judge decided that Chen should get back his 64 taels, and that the daughter should go to the other man and thus escape the necessity of singing the "Plum Tree Ode."

This little bit of sentiment tacked on to a Chinese judgment requires some explanation. It has reference to an ode in the *Shih King*, or Book of Poetry, which represents a maid lamenting the lack of suitors for her hand.

The aptness of the allusion will be understood if I read a translation of the ode made by Mr. Clement Allen :—

The plums are ripening quickly,
Nay, some are falling too ;
'Tis surely time for suitors
To come to me and woo.

See more and more are falling
From off the parent tree ;
Why don't the men come forward
To win a maid like me?

At length upon the plum tree
No fruit can be espied ;
Yet no one comes to court me
Or bid me be his bride.

And that is the song that a well-conducted Chinese young woman sings when the time has come to ask herself "Why don't the men propose?"

A very important part of a magistrate's duties is the collection of the land tax. It is chiefly out of the land tax that he pays his current office expenses and meets the many calls that are made on him. The land tax is paid in money or in grain. It was immutably fixed at the beginning of the

dynasty. There would thus seem to be little room for illegal exactions, but a district magistrate is not behind others in getting round rules and regulations, and in causing theory and practice to come in conflict.

One way of getting more than the proper quota is to convert the tael into cash at an arbitrary rate ; thus for every tael due a man will have to pay 2,400 instead of 1,200 cash. In addition to this there is a fee of from 10 to 15 per cent. for meltage, a fee for collectors' receipt, and sundry local charges of various kinds.

For taxing purposes the land is arranged on what is known as the fish scale plan, that is, each division just overlaps the next. A district is divided into *tu* and *chia*, and the *chia* is the unit of taxation. There may be many owners in a *chia*, but in the magistrate's books it is the *chia* that is responsible,—the tax-collector has to get the money from the several holders as best he may. The magistrate is not held responsible for more than eight-tenths of the assessed amount, but hardly a year passes without remissions being made on one plea or other. Frequently a magistrate reports that he has been unable to collect more than 50 per cent. Practically it amounts to this, that the magistrate and his tax-gatherers extort as much as possible from the people, and account for as little as possible to the provincial treasurer. There is an ever increasing debit against the district; and although the item is preserved in the accounts of the yamen for years after, recovery is hopeless, it has in the end to be written off.

There are some 1,300 districts in the Empire, and it is estimated that 60 million taels a year is taken out of the people over and above the amount officially reported. If an equal distribution of this plunder was made this would mean about 46,000 taels per magistrate, but, of course, some get more than others ; and a good deal of the money which thus comes

into their pockets has to leave it again pretty soon to satisfy the demands of those higher in office.

When the tax is payable in grain, the land is assessed at so many tou (pecks) an acre. But instead of collecting the grain, the magistrate levies the equivalent in money, at a rate fixed annually by the provincial treasurer. The rate is always above the market price of the rice, and with the proceeds the magistrate purchases the proper quantity of rice and holds it at the Grain Commissioner's disposal. The magistrate thus pockets the difference between the market price and the commutation price fixed by the Treasurer; so that in districts which are heavily assessed he makes a very good thing of it.

Another source of income is the registration of land sales. The official fee is 3 per cent. on the declared value, with a good many additional small fees. A great many land sales are not registered at the time; but the purchasers wait until the end of the magistrate's term of office, when he reduces his fees in order to get in all he can before his successor takes office. He will even stamp fictitious deeds, and thus make amends to his successor by sowing the seeds of future law-suits which will in due time bring in their crop of fees.

A magistrate is coroner for his district, and as such he is bound to investigate all cases where death has resulted from violence, or where the attendant circumstances excite suspicion. For his guidance there is a book of instructions to coroners, the literal translation of the title being "Record of the Washing away of Wrongs"—the idea being that the manner of the victim's death shall be discovered, and atonement made by giving life for life. The instructions are most minute. The book begins with a chapter on anatomy, which as a scientific work is not of much value. In it we are told that man has 365 bones, corresponding to the days of the year.

The skull of a male consists of eight pieces, but that of a native of Tsaichow has nine. A female skull has only six.

When holding an inquest a magistrate is always attended by one or more experts called *Wu tso*, who handle the corpse, measure the wounds and do all the disagreeable part of the work. Where more than one person have been engaged in a murder, and there are several wounds, the magistrate must fix on the mortal wound and discover who caused it, as only one must pay the penalty of death.

In order to show the nature of the instructions I shall read one or two extracts. They sound more like extracts from a cookery book than directions for a *post mortem* procedure. "Where a corpse has to be examined, prepare for use plenty of onions, red pepper, salt, and white prunes, also grains and vinegar, in case the wounds are indistinct or invisible. Take besides, an earthenware basin for breaking, powdering, etc. In examining a body where the wounds are not visible, spread grains and sprinkle vinegar upon the corpse, hold up an umbrella between the sun and the parts you want to observe. The wounds will then appear. If the result is imperfect, then take white prunes, adding red pepper, onions, salt and grains and mix it up into a cake. Make this very hot over a fire, and then, having first interposed a sheet of paper, lay it on the part. The wound will then appear.

"In very cold weather, when the corpse is frozen hard and no amount of grains and vinegar, however hot, will relax its rigidity, dig a hole in the ground, lay in fuel and make a roaring fire. Then dash over it vinegar, which will create dense volumes of steam, in the middle of which place the body with all its dressings right in the hole, cover it with clothes, and pour more vinegar. When you think the heat has thoroughly penetrated, take away the body for examination."

The same book states that the bones of parents may be identified by children by the child cutting himself and letting the blood drop on the bones. If there is a relationship the blood will sink into the bones, otherwise not. Even a grandchild may identify the remains of a grandfather in this way.

There are some atrocious villains who when they have murdered anyone burn the body and throw away the ashes. The proper mode of procedure is this. Go round and search for any spots where the grass is stronger and taller than usual. When you have found the spot, cut down the grass and burn large quantities of fuel till the place is extremely hot. Throw on several handfuls of hemp seed; the oil from the seed will sink into the ground in the form of a human figure, and wherever there were wounds on the dead man there will the oil have collected together exactly in the shape of the wounds inflicted on the victim.

It is not only in cases of murder, or death under suspicious circumstances, that the magistrate examines wounds. If a man has been seriously wounded in a brawl, so that there is danger of the wounds proving fatal, the magistrate must fix what is called the period of responsibility,—that is, he determines the number of days within which, if death occurs, the accused will be considered guilty of murder. The Book of Instructions to coroners remarks that the relatives of a wounded man generally desire his death in order that they may extort money from the slayer; but the accused wishes him to live that he himself may escape death. Therefore the magistrate should order the wounded man to be given into the custody of the accused, who will do his utmost to restore him to health. This institution of a period of responsibility is a merciful endeavour to save the lives of both, says the book.

Prisons.

In every magistrate's yamen there is a prison. The care of prisoners is a weighty responsibility, for if any great criminal escapes the magistrate gets into trouble, as he also will if any prisoner who has influential friends outside dies in prison. It is well known that men are not infrequently done to death in prison ; it may be done by the jailers, who torture and starve their prisoners in order to get money out of their friends; and when a bitter feud exists between two parties, one will bribe the jailer to make away with his adversary. When also one of a gang of robbers has been caught, his confederates will cause his life to be taken before he can be made, under torture, to disclose the names of the rest of the gang, on the principle that dead men tell no tales.

In an important city the prison is in three parts :—

1.—The great prison, *Ta chien*, where are lodged prisoners guilty of capital crimes. Such a prison is planned with a view to prevent escape. It is surrounded by a high wall with only one entrance, through the keeper's rooms. Inside the high wall, separated from it by a paved alley six feet wide, is the wall of the prison proper. This alley entirely surrounds the prison, and from it are doorways which lead into the wards.

2.—The inferior prisons, *Chi so*, confine persons charged with minor offences, such as theft, swindling, debt, etc. The rooms are usually crowded, so much so that the occupants cannot all lie down at the same time. Prisoners in these rooms get nothing but rice, but if they have money they may buy luxuries.

3.—The third class of prison is the *Chai kuan* or police prisons. These are for the detention of persons charged with debt or lighter offences, and for the purpose of squeezing the innocent or guilty who fall into the hands of the police.

The inmates of all prisons have the privilege of working at any handicraft they choose, and of enjoying the proceeds of their work. But the occupation one constantly sees in prison is gambling. Besides those engaged in the game there are others looking on with interest, and no doubt many thus spend their time until the fatal hour arrives when they are hurried away to the execution ground.

Executions.

The magistrate is sheriff of his district, and has to carry out executions. When the death warrant is received from the provincial judge, the magistrate orders his guard to go on watch. When all is ready the culprit is brought out and identified by the records. The criminal is then taken out to the execution ground and delivered to the executioner. If the head has to be exposed it is given in charge of the local headman. Where the penalty is strangulation the body is delivered to the relatives. Care must be taken that the executioner does not extort money before giving up the body. Any effects belonging to the criminal must be handed to his friends. If he has no friends, they should be distributed amongst the other prisoners.

Famine Commissioner.

The magistrate is a sort of famine commissioner for his district. It is his duty to see that the public granaries are kept full, and to encourage the village communities to store up grain against bad times. In time of distress the relief must be distributed impartially; and no man may claim a larger share by reason of his having contributed more largely than his neighbours. Persons who have contributed in time of plenty are not entitled to relief after they have left the

district; and in the same way a new-comer must not be denied relief on the ground that he has not previously contributed anything to the general stock.

In distributing relief in bad times the destitute and needy are classified in two categories. The very poor are those who have nothing left but four bare walls. The next are those who have a little furniture, but nothing to eat. A person over 12 years is a large mouth, below that age he is a small mouth, and gets half rations. Should a member of the household die in any month no reduction in the amount of relief must be made during that particular month.

Locusts.

When swarms visit the district the magistrate has to take steps to destroy them; and when the eggs are hatched and the young insects have not yet got their wings they must be exterminated before they can grow up. The magistrate must encourage the country people to collect the eggs and burn them, and to that end he must establish various stations where a good price is paid for every catty of eggs brought in.

A curious fact in natural history comes out in the instructions given to magistrates in this connection.

When land is flooded, shrimps appear and deposit spawn. When the waters recede the eggs get buried in the ground, and the next year, if there has been no frost or snow, the shrimp spawn produces locusts. To tackle locusts is bad enough, but a magistrate is required to destroy tigers if they are found in his district. He is advised to offer large rewards for their dead bodies, and to keep up a corps of tiger-hunters, who must be liberally rewarded for slaying the animals and severely punished for refusing to face them.

Repairs of Public Buildings.

The magistrate is responsible for the maintenance in good order of city walls, prisons, official temples and public buildings. Where the outlay is considerable, funds must be obtained from the Provincial Treasury, but for small repairs the magistrate must find the money. For this purpose he may employ the fines imposed by him on litigants, and in minor offences he may allow the culprits to commute the penalty by contributing bricks, lime, wood and other materials. Offenders without any money may supply labour instead.

Where the work to be done is of great public utility he should urge the rich people in his district to contribute money, and see that it is expended under the supervision of a committee. The magistrate is also educational officer and guardian of the people's morals.

The students of each district throughout the Empire undergo a series of preliminary examinations before the magistrate of their own district previous to their being examined by the Literary Chancellor of the province. To the successful students he issues a certificate of merit which enables the recipients to style themselves *Tung sheng*, or students, and on receipt of this diploma they may present themselves for the examination for the first degree of *Hsiu tsai*.

It is also incumbent on the magistrate to see that free schools are established throughout his district; and to encourage education by offering rewards to the most proficient pupils. In rural districts there is a good deal of encouragement given to study, and the public college is a feature in the landscape on many a country side.

I have attempted to give an outline of the matters which occupy a magistrate's attention during his tenure of office. The term of office extends over six years, and he may remain

at his post for that time unless he is denounced for incapacity or any serious offence. Every three years the Viceroy or Governor reports on the conduct and capacity of all the magistrates in active service. They are classified in three lists. In the first list are those who are specially mentioned for good service; the second list contains the names of the mediocre men, of whom there is nothing particular to be said, good or bad. In the third list are the names of those who are denounced as useless, dissipated, covetous or extortionate,—these are always ordered by decree to vacate their posts. Even a well-conducted magistrate may be prevented from completing his term of office by circumstances over which he has no control. He will have to vacate his post and go into mourning should either his father or mother or paternal grandfather or grandmother die; and should a near relative like father, brother or uncle get appointed to the same province, he will, if he is of inferior rank, have to apply to be transferred to another province. After a successful tenure of office, during six years, he will either obtain promotion to a higher rank, or be transferred to a more important magistracy; and should he die in office, if he has been a meritorious servant, an Imperial Decree will order that all charges which are written down against him shall be erased, so that he may rejoin his ancestors with an unblemished record.

ON THE CHINESE COINS AND SMALL PORCELAIN BOTTLES FOUND IN EGYPT.

By Natalis Rondot.

Dr. Edkins, in a communication read before the China Branch of the Royal Asiatic Society [1] on the 24th of January 1894, spoke about the small Chinese bottles found in various parts of Europe and said they were used for containing medicines.

He specially remarked on two of these bottles, found at Arles by the Rev. James Johnston, of London, and both bearing Chinese inscriptions; one read: "Only in this mountain;" and the other: "The Yangtze-kiang stretching for three thousand miles;" the former sentence is from a T'ang dynasty poem; I will refer again to it in the following pages.

Another member of the Royal Asiatic Society, the Rev. W. Muirhead, recalled, at the time of this communication, the opinion formerly expressed by Sir Walter Medhurst that Arabian travellers to China had taken back medicine bottles and left them in the tombs of Egypt and other ancient ruins. In this way the curious fact might be explained that the bottles of the T'ang dynasty should be found in such places.

Another member, Mr. Volpicelli, was of the same opinion, and added that the Chinese medicine bottles found

[1] *Journal of the China Branch of the Royal Asiatic Society*, New Series, Vol. xxvii., pp. 247 and 248, December 1895.

in Egypt and Europe had probably been introduced there by Arab merchants, whose most flourishing period of trade with China was during the T'ang dynasty, and, indeed, verses, or parts of verses, written at that time, *i.e.* during the 7th, 8th and 9th centuries, can be read on the bottles.

I thought the story of those bottles had been cleared up after the researches and discussions in which I took a part about forty years ago, but the remarks presented at the Royal Asiatic Society in Shanghai induced me to reconsider the subject.

I was studying the subject for several years, chiefly in 1852 and 1853, and was helped in it by my friends, Stanislas Julien, Auguste Mariette, W. H. Medhurst, S. Wells Williams and Sir John Bowring, but I thought it useless to publish the account I had prepared, and which was advertised by Stanislas Julien in 1856 in the preface to his *History of Chinese Porcelain*, as the conclusions at which I had arrived seemed to be generally accepted.

I had the opportunity of seeing at the Louvre Museum in Paris, in 1851, some small Chinese porcelain bottles brought from Egypt and nearly all collected by Clot-Bey ; some had the picture of a flower and a Chinese inscription on them, the others were covered with ornaments in very slight relief.

I was struck by the likeness of these bottles to others of the same kind I had seen in China in 1845 at a porcelain factory in the Fokien province.

Such was the starting-point of my special researches. My first care was to get drawings of all bottles of the same kind kept in the public and private collections to which I had access ; by so doing I brought together about fifty drawings.

These porcelain bottles seem to have been used for containing medicines ; they are from four to seven centimeters high and the body is flat ; the greatest number are covered

with ornaments moulded in the paste and coated with enamel, generally coloured in pale green; others have on each side either flowers or flying bats, painted with a few strokes of the pencil, and verses or parts of verses written with a running hand; some of them have part of their surface green and rough.

I will speak afterwards about the inscriptions, but one fact is certain: some of the bottles have been found in Egypt, some in Syria (and in the south of France?); none of those findings seem to have preceded the beginning of this century, or at least they were not announced before that time.

I first devoted my efforts to making sure of the genuineness of the original finding.

I will begin with those found in Egypt—yes, they have been collected in Egypt—do they come from old tombs as asserted? This is not proved.

Rosellini has described one found by himself, said he, in an Egyptian tomb "not previously opened, and built, if judged by the style of the hieroglyphs in the Pharaonic period shortly posterior to the 18th century B.C." [*I monumenti dell' Egypt, etc.*, Pisa, 1834, part II, fo. 337.]

Rosellini was quite sure that the tomb had not been broken open before his visit, and this is what he wrote to Sir John Francis Davis:—"I broke down myself the small brick wall obstructing the entrance to the vault and went into one of the three tombs, where I found, with other Egyptian objects laid in a small basket made of interwoven palm leaves, the said small bottle." [2]

[2] I had in hand the original French text of Rosellini's declaration sent to me by Sir J. Francis Davis [letter of the 16th of August 1852]. I knew Sir J. F. Davis in 1845-46 at Hongkong, during his governorship of the island.

Was not Rosellini imposed upon? Mariette thought so and wrote to me, on the 20th of April 1853 :—"Yes, Rosellini has possibly been present himself at the actual finding of the bottles in the unbroken tomb and we must believe his assertion on this point. . . . But the question is to know if the tomb had never been really opened before that time, and I am all the more doubtful respecting this because I am myself well aware how the Arabs prepare with incredible dexterity the findings they will cause you to make on the day after."

Other bottles found in Egypt had been brought to England. Sir J. Gardner Wilkinson mentioned them in the book he published under the title of *Manners and Customs of the Ancient Egyptians* [Part III, 1837, fo. 106 to 109]; he had then no doubt of their antiquity; after a certain time he was less positive, and I read in one of his letters dated 12th of August 1852 :—"I am quite convinced that the bottles have been found in the tombs near Thebes, but as the country people are obliged to work secretly, the exact date of the tombs, from which the bottles come, cannot be fixed now; I had four or five in my possession and saw more than twenty of these bottles. Though it is not possible to decide positively about their antiquity, there is a probability that they are at least as ancient as the Cesars or the Ptolemies. We can suppose they passed from China to India and thence to Egypt, containing some product much valued there.

In 1836, Sir J. F. Davis published his book *The Chinese, or General Description of the Empire of China*. He reproduced Rosellini's opinion, and in reference to the discussion about these small objects which had then in England excited great curiosity, he observed that they were similar to the snuff-bottles then made in China; nevertheless he acquiesced in Rosellini's and Wilkinson's ideas [Part II.]

Sir John Francis Davis came to Paris in 1836 and consulted Stanislas Julien about the Chinese inscriptions which he could not read. Julien then showed him how impossible it was to refer them back to the 18th century B.C., as the writing inscribed on them was used in China only since the years 48 or 33 before our era.

Davis was only half convinced; I mean that he admitted they were not so old as was supposed, but continued to take his findings as genuine, even in his last books; it seemed to him "extremely curious, but at the same time very perplexing" that so many Chinese bottles had been found in the old Egyptian tombs.

In 1837, Rosellini's opinion was still admitted as the truth, and this "finding of Chinese bottles at Thebes, in deep excavations" was combined with the assertion that "figures of characters, undoubtedly Chinese by their faces and costume, were found painted by the Egyptians amongst the foreign nations represented on one of the oldest tombs in the same place" [Champollion, Figeac; *Egypte ancienne* 1847, fo. 85].

We now come to 1852 and 1853, when my observations took a definite form.

The bottle found by Rosellini was regarded as specially interesting. Rosellini brought it to Florence, where it was kept in the Egyptian collection he had formed there; he had sent a drawing of it to P. Lepsius, the celebrated Egyptologist, and this gentleman communicated it to Stanislas Julien, in a letter dated 7th of August 1836.[3]—On one side, an amaryllis in flower was printed in a cartouche, and on the other were Chinese characters written incorrectly.

[3] I have yet in my possession the letter from Lepsius and the drawing sent at the same time.

On the 20th of August 1852, I sent a copy of this inscription to W. H. Medhurst, Junior, then secretary to the Superintendent of Trade at Hongkong, and received his answer on the 26th of October. Mr. W. H. Medhurst had been able to read the sentence, to translate it, and to discover, with his Chinese teacher's help, the poem from which the verse was taken; it must be read as "Hoa khaï yeou yih nien, *i.e.* The flowers blossom and this is a new year," and is part of a sonnet found in a small text book of poetry for children's use named *Thsien-kia-shi.* The sonnet is assigned to Wei ying wou, living during the reigns of four T'ang emperors, between 702 and 795 A.D.

This bottle found in an Egyptian tomb regarded by Rosellini as unbroken and as being nearly 3,600 years old, bore on it its date, and this date was derived from a verse written during the 8th century of our era.

I did more, I gave to W. H. Medhurst and to my friend S. Wells Williams eleven other inscriptions copied from Chinese bottles, brought from Egypt and kept in the Louvre Museum or communicated by Sir Gardner Wilkinson; I sent also the same to my friend Sir John Bowring, then British Minister to China, who was deeply interested by these enquiries.

The first result obtained was that the inscriptions were not written in the ancient characters. They were not even in the characters called Tsau-shu, or grass characters, nor in characters known as Hing-shu. They were all in mixed writing, participating in each of these forms of the characters, and they were inaccurate, as ignorant workmen could have hastily written them on cheap and common ware.

In fact, the eleven inscriptions were reduced to five, as, under various forms, some presented the same text; amongst them, two had the same sentence as that of Rosellini "The

flowers blossom and this is a new year." One, found at Coptos, is at Alnwick Castle in England, and has an amaryllis on one side; the other is at the Louvre Museum, and has on the side a kind of Petunia.

No. 1.—Rosellini's bottle.

No. 2.—Bottle found at Thebes, communicated by Sir Gardner Wilkinson. Other bottles in the Louvre Museum. [On one side, an amaryllis in flower, on the other "Ming youeï song tchong tchao—The clear moon shines through the firs—this is the third verse of a sonnet named Chan-kiou-thsieou-ming—An autumn day in the mountains—Written by Wang wei, a poet living during the Kaïyouen period—702 to 745 A.D., under the T'ang dynasty.]

No. 3.—Bottle at the Louvre Museum and at the Lepsius collection in the Berlin Museum. [On one side, an amaryllis blossom, on the other "Tchi-tsaï-tse-chan-tchong." Only in this mountain—the third verse of a quatrain—"In search of the missing," written by Kia-teou, living under the reign of Houï-tchang, of the T'ang dynasty [831-837 A.D.] We have already seen that Dr. Edkins has mentioned one bottle found at Arles as presenting the same inscription.

No. 4.—A bottle found at Thebes, communicated by Sir G. Wilkinson—Liaou-tih-cheou-jin-tchi. "What a few can feel."—Last verse of a quatrain written by Tchao-yong, who died during the reign of Chin Tsong (1068-1085), Song dynasty.

No. 5.—A bottle at the Louvre Museum. [On one side a sunflower blossoms, on the other side "Hang-hoa-hong-li—The almond tree blossoms all over the country." Part of a verse written by Sou-tong-po, living under Chin-tsong, 1068-1085, Song dynasty.]

These decipherings and translations were communicated to me in October and November 1852, by W. H. Medhurst

[letter of the 26th of October 1852] and S. Wells Williams [letter of the 26th November 1852], and their interpretations were very slightly different.

The inscriptions preserve to us verses from poems of the T'ang and Song dynasties, *i.e.* between the 8th and 11th centuries of our era, and the poems from which the verses are taken having been found, Stanislas Julien, S. Wells Williams and Medhurst have proved that the poems could not be older, as shown by their style, form and character.

Stanislas Julien was the first in 1836 to be convinced of the error of the archeologists, who thought these Chinese bottles were as old as the Pharaohs, by appealing to the fact that the Chinese characters written in the "tsao" or running hand was not used in China before the emperor Youen-té (between 48 and 33 B.C.) and if it be observed that the writing of the inscriptions on bottles is often more related to the Hing-chou, *i.e.* the free running hand, we obtain a date rather less ancient, seeing that the Hing-chou is only as old as the emperor Houan-ti (147-167 A.D.)

W. H. Medhurst did not specially examine the writing, as it was very inaccurate and sometimes executed in a style extremely crude ; however, allowing a certain importance to this fact, he thought the writing could not be anterior to 229-260 A.D.

Another consideration was left—the material of the bottles. They are of different qualities, some are certainly made with porcelain ; Stanislas Julien thought the discovery and use of porcelain in China could only be placed between 185 B.C. and 87 A.D. ; Medhurst specially quotes on this point a writer living under Tai-shï of the Tsin dynasty, (260-268 A.D.) ; let me add that in 1844, during the negociations which ushered in the signing of the Franco-

Chinese treaty, one of the Chinese envoys, Chao-chang-li, well acquainted with the antiquities of his country, affirmed to me that the manufacture of porcelain could only be traced back as far as the middle of the 6th century.

In short, the antiquity of the small bottles in question must be absolutely rejected.

This once settled, we must assert that none of the reliable explorers of Egyptian monuments has ever met Chinese bottles. I have the evidence on this point of Champollion, Lenormant, Lepsius, Emmanuel de Rougé, Mariette.

Lenormant wrote to Stanislas Julien in 1852, that to his knowledge, these bottles were never found [in Egypt] except in the ruins of houses in the villages, together with other vases either Arabian or Persian.

Mariette also wrote to myself on the 20th of April 1853: "The small Chinese bottles were always sold on the Arab markets as curiosities and objects of luxury used to adorn the shelves in the Turkish houses. . . . I was able to buy myself two of them on the Gizeh market; a friend of mine showed me some from the Siout market; another friend told me he had seen many in Damascus and other Syrian towns. The liking for Chinese curios has always been strong all over the Levant, and the caravans, coming every year to Cairo, either from Persia, by the Isthmus of Suez, or from Mecca, by Djeddah and Cosseïr up to Geneh, a town very near to Thebes, spread numerous specimens through all Egypt, though, I must say, the same taste for Chinese articles seems slowly to disappear, since French fancy articles have become the fashion in these Musulman countries.

"To sum up, the Egyptian Arabs will never acknowledge the Chinese bottles as antiquities, and it is only at Thebes that the natives will dare to sell them as such."

I will now speak of the information I collected in China. One single Chinese testimonial favourable to the antiquity of these bottles is known to me; it has been produced by Sir J. F. Davis, whose ideas on the subject have been but slightly modified. We read in his book on China, published in 1852: "Our guest (the Shanghai Taotai) to whom we showed a Chinese bottle found in the Theban tombs in Egypt, declared in favour of its antiquity, on account of the polished foot, which is always rough in the modern porcelain ware." [Part II, fo. 65.]

I wonder Sir J. Francis should have given in such a matter so much confidence to this Chinese Taotai.

I must come back to my starting-point.

I was sent in 1845, by the French Minister, to Tchang-tcheou-fou, capital of the Fokien province, at a distance of a day from Amoy. In returning, I stopped in the small town of Chima, situated on an arm of the Tchang river and near to some porcelain factories. An enormous quantity of bowls, cups, goblets, vases, statues, made of a coarse and extremely cheap porcelain from this part of the Fokien province, is in demand in the Indian Archipelago. They are specially manufactured at Pia-long, whence the junks take the various products to Chima.

I bought some of these wares in the China stores, and amongst them small coloured bottles with ornaments in low relief, some white, others pale green, yellow or greenish dark blue.

At the same time, I did not see there bottles with flowers painted in white cartouches or with inscriptions. Certainly some of the bottles at the Louvre and Berlin Museums were very similar.

My personal evidence will be confirmed by that of S. Wells Williams. When I requested him to give his

opinion about the inscriptions on the bottles supposed to have been found in the Egyptian tombs, I explained to him that vases similar, but without inscriptions, were every day made in Fokien, and asked him to look in the Canton shops to see if there were not some like those found in Egypt.

On the 26th of November 1852, Wells Williams answered me as follows; "I send you herewith painted drawings of bottles I could find here (at Canton) in the shops; you will see two of them have in cartouches the same verses as those I translated for you. One reads: "Ming youï song tchong tchao (Moon shines through the firs)"; the other: "Tchi tsai tse shan tchong: (Only in this mountain)." But, as you will observe, the characters are written with a running hand sufficiently exact and more legible for the greater number of buyers.

A rather larger square bottle, not similar to those found in Egypt, presents, on one side, two verses from a poem of Wei-ting-wou, who was living in 770 under the Emperor Taï-tsung, and on the other side two verses from Sou-tong-po, who lived at the time of Chê-tsung; on the two other faces, an aster or a chrysanthemum in blossom.

The majority of the bottles, continues Williams, have no inscriptions on them. I suppose these with ornaments in relief are more common at Amoy and Tchang-tcheou where you bought them. I went myself or sent to about fifty shops, and saw only three vases with verses written on them: that is, those I mentioned to you; they are generally ovals.

The bottles with narcissus in blossom on one side and bats on the wing on the other are very common[4]; I only saw

[4] Mr. Olfers pointed out to me that the Lepsius Collection in the Berlin Museum contains bottles brought from Egypt and showing also bats on the wing.

one with the narcissus or the cymbidium. There are large numbers of these small bottles of so-called antique shape with flowers but without inscriptions; they are sold for four to eight cash apiece and are used for containing snuff or medicines." Briefly, Williams concluded against the antiquity of the bottles found in Egypt.

He observed that, at the time of his writing in 1852, there existed yet an important export of porcelain and earthenware to India, and that small vases or bottles were specially sought after for storing medicines, oils, perfumes, etc.

W. H. Medhurst, following Dr. Medhurst, concurred on most of the points with Wells Williams. He remarked, however, that the small vases, commonly made of coarse porcelain, had been probably used for medicines only The Chinese, who use tobacco snuff have bottles of less coarse material and very often rather finer. The Chinese sailors and coolies so commonly met with in the Indian Archipelago and Indian seas carry as a rule with them during their travels drugs and medicines of more than one kind. Before I devote my attention to the coins, I cannot but mention that, about the end of the last century some seals were found in a peat-bog in Ireland which were considered to be Chinese.

The small difficulty about the Chinese bottles found in Egypt is, to my mind, resolved.

These bottles are modern; the verses written on them as decorations are extracted from popular poems, written between the 8th and 11th centuries. The actuality of their fabrication is proved by the assertions of merchants at Canton, who said they knew very well those objects of every-day sale, that they were very cheap, and that those with inscriptions were scarce on account of the small demand from sailors; and finally

I saw myself the bottles at Pia-long and in China, one of the centres of manufacture of this ware.

Chinese coins have also been brought from Egypt, and they were supposed to be ancient.

A former member of the Egyptian Institute, J. Marcel, who was superintendent of the National Printing Office, had a small collection of Chinese coins, divided into three parts.

In the first part were coins formerly belonging to the abbot of Terson, a scholar very much interested in Asiatic objects of art and research; in the second part were coins given to Marcel by Klaproth, who had collected them in China. In the third part were coins bought by Marcel in Egypt, either from Arabs who pretended to have found them in old Egyptian tombs, or who sold them together with Egyptian antiques, without explaining their origin; or from pilgrims who, after proceeding from India or Central Asia to Mecca, extended their journey to Cairo.

I will only remark on this third part of the collection, first that they are very common coins, and that, during my residence in China, about fifty years ago, they were, with more or less abundance, in active circulation.

Marcel gave me the coins bought by him in Egypt; I classified them. They consist of 83 specimens, belonging to 41 different kinds of coins issued between the 11th and 19th centuries (specially 17th and 18th.) Thus you will see that they are all recent, and it should be noted that Marcel had bought them during the last years of the last century and the first two or three years of the present.

SEALING AND WHALING IN THE NORTHERN PACIFIC.

By E. Brass.

Of all the mammals living in the Pacific, the group of seals comes first, from a commercial point of view. Especially the fur seal, *otaria ursina*, has roused general interest, as well by the special conditions of its life as by the international complications which have arisen out of the merciless pursuit of this valuable animal.

Between Alaska and Kamschadka two groups of rocky islands of volcanic origin rise grimly out of the ocean, plains and sheltered valleys covered with a scanty grass vegetation in the interior, the outer rim naked cliffs and rocks and shelving terraces towards the beach. These grey inhospitable shores form the home of the fur seal. The northernmost, the Commodore group, consisting of Copper and Behring Islands, belong to Russia, the Pribilof group, south-east of the former, consisting of the islands St. Paul and St. George, belongs to the United States of America. Every spring, in the month of May, the fur seals appear here in large processions. First comes the vanguard of old bulls, which inspect carefully and suspiciously the old "rookeries." Everything appears in good order, and now follows wild fighting for the best places. The places next to the surf belong always to the strongest. About the middle of June the better halves appear, swimming in long files, shy and bashful, but eager to be wooed and won. And the wooing is rather wild. While the gentleman on the

ground floor has secured already one wife and is stretching his flappers lovingly towards a second, a gentleman of the next floor has meanwhile unlawfully appropriated the first, but may be robbed in his turn in the next moment by someone living on the third floor. Long and hot is the fighting, and the bellowing of the excited bulls may be heard a long distance. But finally everything is settled, and the fair ones distributed among the different harems.

The selfish old gentlemen at the lowest terrace have managed to secure ten or twelve lady friends each, while the less favoured ones on the higher ranges must be satisfied with three or four. Higher up still, on the grassy slopes, the young bachelors of one to four years of age reside, who are considered too young yet to undertake the cares and pleasures of a household, intermixed with the young and playful maidens. Some grim old grandfathers, called "wigs," are also relegated to these regions. Alas, their teeth are not sharp enough any more, and their limbs have lost the nimbleness required in the struggle for the survival of the fittest.

Shortly after the landing the young ones are brought forth, and about a week later the new honeymoon begins. The young one, when born, is covered with a short black bristly fur without any underwool, and called "black pup." After three months the greyish underwool begins to form, and the name "grey pup" is given to the animal.

Within nine months the formation of the fur is finished, brown bristly tips, and a fine silky light brown underwool. At the end of August, the males, which have not taken any food during their long honeymoon, leave the island, followed about the middle of September by the whole crowd of females and pups. But the females have not lived on love alone during this period, but have made fearful havoc among the scaly denizens of the deep.

Only the immense wealth of the ocean can sustain the damages which a million of hungry seals create among the fishes. The whole winter is passed by the fur seal on the open sea, never touching land, sleeping during the night on the surface, lying on their sides with the flappers out of the water. A grown-up fur seal of respectable length is six feet. The front flappers have no visible toes, the back feet, which grow together with the tail, have long sharp nails.

The flappers are covered with a rough leathery skin, which enables the animal to climb the rocky cliffs with comparative ease.

Shortly after the landing of the seals the slaughter begins. A number of Aleutes, armed with heavy clubs, try to separate a troop of 400 to 500 young bachelors, which, as stated before, remain always on the upper slopes, and drive them towards the interior. Only these young males from one to four years old are killed on the islands. This driving must be done very carefully, as the seal, gentle as he is as a rule, makes desperate use of his sharp teeth if driven too hard. Every two or three minutes they must be allowed a rest, and the driving is only possible on wet days, when the grass is damp. Arrived at the slaughter-place, a knock on the head with the club finishes them. A few cuts with the knife, and the skin with the blubber is removed.

The skins are then roughly fleshed, salted, put in bundles, and shipped by special vessels to London. Here they are assorted into small pups, large and middling pups, which are more valuable than the larger skins of the adult seals, the small and middlings. The whole output is then sold by auction, those from the Pribilof group in November, those from Copper and Behring islands in March. The former ones, known in the trade as Alaska skins, are better in quality still. The upper hair of the skin is then removed by

a special process, and the wool dyed a glossy dark brown, in which state the fur is known to everyone. Formerly this could be done only in London, but now there are large establishments in Leipzig, Paris and New York. The sealing industry has passed through many different phases. Originally the hunting was very irregular, everyone tried to catch as many as possible.

The Russians once burned 300,000 skins to avoid glutting the market. Later they regulated the sealing, limiting the killing to about 50,000 annually.

After the cession of Russian America to the U.S., the monopoly of the sealing was given to the Alaska Commercial Company in San Francisco, which was only allowed to kill annually 100,000 seals, and use only native Aleutians for the killing. The latter received $0.50 gold for each skin,—good wages, as a skilled man can kill and skin about 50 seals a day. $1.00 had to be paid to the government; freight, salt and sundries came to about 50 cents more. As the skins fetched from $10 to $20 gold apiece, no wonder that the company paid 80 to 100 per cent dividend. In 1869 the firm of Hutchinson, Kohl & Co., in San Francisco, obtained the sole right to catch seals on the Commodore Islands, restricted to 60,000 seals annually for 20 years, from the Russian government, and sold the concession to the Alaska Commercial Company, which possessed also fur trading posts along the whole coast of Alaska. After the expiration of the lease, the concession was given to a Russian Company in St. Petersburg.

Up to about 12 or 13 years ago, the seals were well protected: American cruisers watched the Pribilof group and warned all vessels off, and a similar vigilance was kept by the Russians on their shores. At least a million seals assembled annually on the rookeries. But the prize was too valuable to be let alone. From Victoria and Vancouver in British

Columbia, a number of small schooners of 20 to 100 tons were fitted out, Tacoma and Portland, Oregon, followed suit, and pelagic sealing began. The herds of seals, which kept during the winter in the open sea, were followed up and killed ruthlessly. Pregnant females, pups and old ones, fell to the shots of the eager hunters. Some schooners returned with 4,000 to 5,000 skins on board; and as 50 or 60 schooners were employed, the destruction dealt to the seals may be imagined. The seals appearing on the breeding grounds decreased rapidly.

On the Russian islands it was still worse. Schooners, not satisfied with pelagic sealing, appeared in the neighbourhood of the islands, and, waiting their opportunity of a foggy day, sent their crews ashore and secured some thousand seals right on the rookeries. Russian warships were always on the look-out, and many schooners were seized and brought to Vladivostok, where I saw myself at least a dozen of these confiscated vessels.

A curious case happened while I was in Yokohama in 1891.

The British schooner *Arctic* was seized by a Russian man-of-war while she had only 80 skins on board. The ship's papers were taken away, and the captain told to follow to Vladivostok with his vessel. During a fog the ships got separated, and the schooner headed straight for Behring Island, killed 3,000 seals, and sailed to Yokohama without papers. The port could not be entered, but a boat was sent in. The Russian Ambassador applied at once to the Japanese authorities to have the schooner and cargo seized, but in the meantime the *Edgar* had gone out, piloted the *Arctic* in, and two hours later the cargo, worth £10,000, was on board the P. & O. steamer *Verona*. The Americans went a step further than the Russians, and declared the whole Behring Sea a

closed sea, and seized every vessel fitted out for sealing, *i.e.* having raw salt on board.

This gave rise to international complications, as Canada (or, rather, England) did not acknowledge the right of America to a larger extent of sea than three miles from low-water mark round the Pribilof Islands. A large number of lawsuits were pending against the U.S. Government for damages.

Then, in 1893, a conference between England and America took place in Paris. It was finally agreed that pelagic sealing should be restricted to the summer months, from April to September, and that the sea within a radius of 30 miles from the Pribilofs should be considered American water. On the other hand, America agreed to restrict the annual killing on the rookeries to 7,500 seals, and pay the damages awarded to the owners of the unlawfully seized schooners. These damages, by-the-way, are not paid yet, as far as I am aware. These measures helped a little, but not much. In the spring 20 to 30 schooners are to be seen in Yokohama harbour alone, and there are still 60,000 to 80,000 seals killed by pelagic fishing. This amount is not startling in itself, but, as I stated above, the females and young ones are caught indiscriminately, while on the rookeries only surplus young males were killed. The damages done by pelagic sealing are evident. Recently another attempt was made to protect the seals by concerted measures of the interested powers, but as the U.S. insisted that Japan should join the conference and England objected, the whole thing came to nought. Japan does not take part at present in the sealing industry, though there are seals on the Kuriles, and the Japanese ports are largely used by the American and Canadian sealers. Moreover, the best seal-hunters are natives of the Bonin Islands, but Japan forbids their signing on any but Japanese

vessels. Nevertheless a number of these intrepid half-castes manage to elude the vigilance of the Japanese authorities. A short time ago the news was reported that America refused admittance not only to raw sealskins, otherwise than those shipped by the Alaska Company, but also of sealskin garments, if not accompanied by a certificate that the raw material was Alaska seal. That comes practically to a prohibition, as in the auction room a sealskin does not wear a label "a victim of pelagic sealing" or "killed by permission of the Company." The result will not be to stop pelagic sealing, but will only enable the Alaska Company to obtain a higher price for their produce, as they hold now a monopoly of sale in the United States, the largest market for fur sealskin. But I think the rule cannot be enforced for long, unless permission is given to the company to slaughter more than 7,500 seals annually, as this number is quite inadequate for the requirements of the trade. To protect the seals effectually, the only means, in my opinion—as pelagic sealing could never be stopped as long as it pays so well—would be to issue a certain number of licenses annually to Canadian and American vessels to kill only a specified number of seals each, say 1,000 or 1,200 ; a government agent to accompany each vessel, and see that the obligations of the license are fulfilled. The charge for the license must be high, and if possible only a limited number of licenses issued.

Any vessel then found in Behring Sea or Japan Sea fitted out for sealing without a license should be confiscated.

If first a close season of one or two years was fixed, afterwards the yearly killing of 20,000 or 30,000 pelagic seals, and 50,000 or 100,000 seals on the rookeries, would do no great harm.

The most valuable fur-bearing animal is still more liable to extinction. This is the sea otter, *enhydris marina*. Their

abode is of very restricted area. If you draw a line from Yesso to Vancouver Island, and another from Norton Sound in Alaska to the Anadyr in Siberia, the enclosed part shows the only home of this beautiful animal.

But while in the beginning of this century every bay and sheltered nook, each lonely rock and island, was full of the playfully gambolling animals, now they are very rarely met with. In 1896 20,000 skins were brought in one lot to Canton alone. When I joined the fur trade in 1876 about 7,000 annually came altogether on the market, and now only about 1,800 are caught every year.

The skin is the finest and most valuable fur in existence. A full-grown skin measures about six feet in length by four feet, and costs in the London public sales from £50 to £250.

The best quality are dark glossy black, regular marked with white hairs, called silver tips, then follow plain blacks, then the brownish, the grey woolly ones ; so-called donkeys are the cheapest. The biggest market for them used to be China, but the price is far too high for the Chinese, and Russia takes the bulk of the output. Only a few skins are imported into China every year by a very circuitous route, first to London, then by way of Moscow, Nizhni Novgorod or Irbit, to Kiachta on the Chinese frontier : there they come into the hands of the celestials, having changed hands at least a dozen times during the transit.

The sea-otter is not a gregarious animal, and keeps for the larger part of its existence to the water, a life for which its web-footed flapper-like feet are well adapted. Only to bring forth its young does the sea-otter seek the land on some secluded cliff or rocky island. Their food consists of small fish, shells and crayfish. In their native haunts everyone's hand is against the poor otter. The natives of the Aleuts or Kuriles follow them in their leather boats or *baidarkas*, often for days

and days out on the swelling waves of the open ocean, a large number of boats paddling in long line. As soon as a sea otter is sighted, the nearest man tries to harpoon it, while the others close round in a wide circle, to catch it as soon as the unfortunate animal rises again to the surface.

The skin belongs always to the man who hits it first, or, if by two harpoons, to the owner of the harpoon next to the head. The meat is shared among all the hunters.

A number of American schooners are also employed, but use Aleutian hunters, while in Japan only one foreign-owned schooner follows this pursuit, returning generally with about 30 or 40 skins at the end of the season. The only way to preserve this beautiful animal would be for the nations concerned to declare a close season for at least three or four years; if not, it will be exterminated in a few years, like Steller's seacow, which lived in Behring Sea in shoals of thousands till the end of last century. They were exterminated in about 20 years, so that a perfect skeleton is worth now £1,000. The other members of the seal family are not very important in a commercial sense.

The largest is the walrus, *Trichechus sus marus*, an animal of 20 feet length and about 11 to 12 tons weight. It lives along the northern shores of Behring Sea and the Arctic Ocean, and is found in small herds of 10 to 20, always near the coast. The tusks, of about 12 feet in length, give very good ivory, the skin is used for the manufacture of machine belting, and the oil is also valuable. They are killed by the natives, and occasionally by boat crews of the whalers. It is rather a fierce animal, and defends its life very determinedly.

Not much smaller, but quite harmless, is the sea lion, *otaria stelleri*, which is to be found everywhere on the eastern shore of the Pacific. They live on shellfish, fishes, and even waterfowl, doing great damage to the fisheries. The oil is very

fine, but the skin is valueless, the leather being spongy and the hair stiff and bristly. Well-known is the colony of sealions opposite the Cliff House in San Francisco. The other seals, called altogether "hair seals," are very numerous everywhere, in at least 10 different species. Luckily for them they do not live in large herds, like *phoca Gronlandica* in the northern Atlantic, and therefore it does not pay the foreign sea-sealer to hunt them. The Indian, Tuski or Esquimo follow them in a sportsmanlike manner in their lonely kayaks, armed with lance and harpoon, on their native element. The cruel, murderous slaughter, where the defenceless creatures are killed with clubs while on the ice, in untold thousands, and the sucking pups, to save trouble, are killed by kicks of the heavy seaboots in sight of the frantic mothers, is reserved for members of civilised nations. Quite another pursuit is the whaling, which has been called the sport of kings. This industry has been rather neglected of late.

The whales which occur in the Northern Pacific are to be divided into three groups. First the *balaenæ*, which furnish the whalebone; second *physeteridæ*, or toothed whales; and third, the *delphinidæ*, or porpoises.

Among the former group the most important are the bowhead, *balaena mysticetus*, and the Pacific right whale, *balaena cullamac*. These are the only ones regularly pursued by the whaling fleet. They are the giants of the ocean, often 60 feet long and up to 150 tons weight, of which the unwieldy head takes about a third. They have no teeth, but the gum is covered with baleen in rows of 300 to 400 vertical plates of 10 to 15 feet in length and 10 to 12 inches wide, the well-known whalebone.

One right whale or bowhead has often 30 cwt. of this valuable commodity taken out him, of a rough value of £2,000. Of whale oil such a monster gives about 25 tons,

worth £600,—a lucky catch indeed for the fortunate whaler who gets it. But these leviathans of the deep are getting very rare, and have taken refuge among the ice floes of the Arctic, whither the American whaling fleet follows through Behring Strait.

The other kinds of balaenæ are principally the Japan whale, *balaena siboldii*, and the sulphur bottom, *balaena sulphurea*. These give a whalebone of an inferior quality, but more oil than the right whale. But on the other hand they are much quicker and more wary than the latter, and therefore the Americans don't care much to follow them, and thus they are still plentiful in the Japan and Behring Seas.

Still more energetic and of less commercial value is the fin whale, *balaenoptera velifera*, which reaches a length of over 100 feet, but cannot be taken at all by the antiquated methods, because he would take a whaleboat from which he had been harpooned at a speed of 30 miles an hour through the water for a space of two days before he could be tired out.

In large shoals the humpback, *megaloplera versabilis*, is to be found in all parts of the Northern Pacific. I passed myself once in a steamer on the Corean coast through a troop of thirty-five of them. If caught, one of these gives about 20 to 25 tons of oil, and about 8 or 15 tons of inferior short whalebone.

Among the whales with teeth, the most important is the sperm whale, *physeter macrocephalus*, a fellow of 60 feet length with an immense square head, with a very narrow and small lower jaw, which resembles partly the bill of a bird. The mouth is armed with several hundred conical teeth of 4 or 5 inches in length, which pass as currency among several of the South Sea Islands, and are used as material for fine carving on the South American coast. The head contains the well-known spermaceti, which is very expensive now, and the

ordinary sperm oil is also much dearer than common whale or seal oil. In the bladder sometimes large lumps of ambergris—a greyish stuff—are found, and used in the same way as musk.

The sperm whale is not frequent in the north, and prefers as a rule the southern hemisphere. He is rather fierce, and resents any intrusion on the part of whaleboats, crushing them between his mighty jaws. There are even cases known where the fury of a solitary bull was vented on the whaling ship itself, the whale using his head as a ram and smashing the planks like a nutshell.

The whaling is at present in the Pacific exclusively in the hands of Americans, especially from Rhode Island, New Bedford, Martha's Vineyard, etc. There are still a number of sailing vessels in use, and only a few whaling steamers, while the latter are always used on the Atlantic side of the Arctic. Formerly the whalers used to fish during the winter for sperm whales in the southern seas, and during the summer for right whales in the Japan and Behring Seas. But since the latter got rare here the whaling fleet goes every summer through Behring Strait into the Arctic, wintering mostly south of the Strait, on the Tsuski peninsula or Alaska, from whence special vessels, sent out from America, carry home the result of the season ; 30 or 40 vessels are employed here in the whaling, and sometimes they make a very good haul. I remember a few years ago that a small schooner from San Francisco, of 150 tons, went right up to the mouth of the Mackenzie River, wintered there, and caught 16 right whales. They took only the whalebone, which represented at the time a value of $70,000, and left the oil behind, as they had no room for it. Generally whale fishing is managed as follows.

Each vessel, usually of about 300 to 500 tons register, carries 4 or 6 specially built light whaleboats, with sharp stems on both ends, each rowed by four oars, and steered by a long oar over the stern.

In the bows of each boat is placed a double-barrelled gun of special construction, a harpoon gun. From one barrel is fired the harpoon, from the other the bomb lance, a sharp steel blade with short shaft, to which an explosive shell is affixed, which explodes as soon as the iron is buried in the whale's body. Next to the gun stand wooden tubs with 600 fathoms line coiled up, which are attached to the harpoon before firing.

Each vessel has a large crew, 30 or 40 hands, besides the captain, a navigating officer for each boat, a harpooner, a boat-steerer, and the necessary carpenters, coopers, etc.

When the whaling grounds are reached, a sharp look-out is kept from an old cask, fixed in the crosstrees, the "crow's nest."

As soon as the spout of a whale is sighted, the alarm "there she blows" is given, and feverish activity prevails at once on board. The whaleboats are lowered, the lines fixed, and each boat races the other to be the first to get fast to a whale.

As soon as the shot is fired, the command is given to "back water," to keep out of reach of the tail, with which the furious monster lashes the water into foam. But this paroxysm does not last long. Either the whale darts forward with the speed of a torpedo-boat, and receives the deadly shot of the bomb lance as soon as he slackens speed, or he dives straight to the bottom. In the latter case it depends how deep the sea is; if deeper than the length of lines, the latter must be cut or the boat would be dragged under. In case the lines are long enough, the whale reappears on the surface in 15 or 20 minutes and receives then his quietus.

Some of the harpoon guns are so constructed that the shell is fixed to the harpoon, but I have heard that this arrangement does not work satisfactorily.

After killing, the whale is brought alongside the vessel, and then the crew cuts the blubber with sharp spades under the supervision of the "speccioneer." The blubber is cut in one continuous strip of 2 feet in width, to which a hook and chain is attached. The other end of the chain is run through a block on the yardarm and hauled on till the whole blubber is taken off. The latter is then cut in large cubes and stowed in iron tanks below. Formerly the blubber was boiled down on board, but now it is taken home, because the boiling on deck was rather dangerous, and does not give as much oil as can be got at home by modern appliances. But the smell in the hold during summer can well be imagined. After flaying, the carcase is left to sink.

The whole proceeding is very wasteful, and pays only where there is a sufficient number of right or sperm whales.

The Norwegians have inaugurated a much better system, at present, on their own shores in Vardoe and Vardsoe, but the system would work out very well out here and pay splendidly.

A number of stations are established along the coast, from which small but strong steamers of 50 or 60 tones cruise regularly. The harpoon gun is fixed in the bows of the steamer and the whale chased direct without the intermission of boats. By these means even the fast ocean runners, the fin whales, are captured, because they are soon too tired to drag the whole of a steam tug, while the lines are strong enough to act as towing ropes. If larger vessels should be employed, the lines of course would snap at once. The captured whales are towed to the station, and here every part is used besides the oil and whalebone. The bone grease is

extracted, the bones ground into bone meal, and the whole mass of flesh, blood and intestines worked into fish guano.

By these means even the common small whales are worth the catching, and also the different kinds of porpoises, which are plentiful, would give good returns. At present they are only hunted by the natives. The principal members of the dolphin group are the white whale, *beluga catadon*, an animal 15 feet long and one ton weight, and pretty yellow white color, of which many thousands are met with.

Also in shoals of thousands the little grind whale, or blackfish, *globiocephalus scamonii*, is to be found.

The common porpoise, *phocaena vomerina* and *delphinus styx*, which are frequent everywhere, give not only good oil but the skin makes very strong leather. The other dolphins *orca gladiator* and *orca ater*, bear their name, the "Killer," with right, because they are murderous brutes, which attack the whales with the greatest fury, regardless whether it is a little whale or the monster right whale, tearing away large pieces of blubber and flesh till the leviathan succumbs to the loss of blood. The whole fellow is about 10 feet long but very quick and ferocious, generally hunting in small troops. They ought to be exterminated, as they do great damage.

As I remarked before, there is no whaling carried on now in the China and Japanese seas, except by natives near the shore. In 1890 a small company, the Eastern Whaling Company, was started in Japan, with three steam schooners. But the company was rather unlucky. Two of the vessels went down in the first season uninsured, and the enterprise was given up, though the third schooner had captured three bowheads. If a company with sufficient capital and modern methods would be started it would be a paying concern, and another flourishing branch would be added to the industries of the Far East.

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