

the prospect of its attaining a more prominent position than it now occupies. It is gratifying to see that there is no lack of workers in a field whence, as indicated in the Address, such a rich crop of facts have yet to be reaped.

SCIENTIFIC NOTES.

We learn from *Les Mondes* that the triangulations of Central Europe have just been inaugurated in Austrian territory. The first point of the first order is situated on the height of Dabitz, near Prague. All the observations here were most satisfactory. Professor Herr has also commenced observations on the *Schneeberg* of Spiegitz, near Grulich. Here, unfortunately, a man was killed by the overturning of the temporary observatory. The longitude of Dabitz has been determined by an electrical connexion with Leipzig.

The Baron de Deeken's preparations for exploring the river Juba, on the east coast of Africa, and thereby, it is hoped, of reaching the snow mountain Kenia, are rapidly progressing. His steamer will be ready on the 7th of May. Its length is 119 feet; breadth 15 feet; draught of water 2 feet 5 inches. It has paddle-wheels, driven by two low pressure engines, each of 18-horse power; two boilers, steam pumps, &c. Its guaranteed speed is to be nine miles per hour. The cost of the steamer and the outfit, which is entirely borne by the Baron, will be nearly £4000.

The recent number of the *Astronomische Nachrichten* contains an announcement of the death of the late Director of the Observatory at Cracow, Dr. Maximilian Ritter von Weisse. Dr. Weisse was born in 1798, in Ludendorf, in Lower Austria; he was educated at the University of Vienna, where he studied philosophy and law, and left the university in 1822 as doctor of laws. He then devoted himself to the study of mathematics and astronomy, and was appointed in 1823 an assistant at the Observatory of Vienna. In 1825 he became Professor of Astronomy and Director of the Observatory at the University of Cracow, that university having previously conferred upon him by a special grace the degree of Doctor of Philosophy. He was subsequently many times Dean of the Philosophic Faculty, and from 1833 to 1847 was the representative of the Conservator for Prussia, and as such a member of the High Council of the university. In May 1861 he resigned his appointments at Cracow, in consequence of a severe illness brought on by overwork. Since then he has been living in retirement, occupying himself with astronomical reductions. His illness terminated fatally on the 10th October last. The *Astronomische Nachrichten* gives a full list of his published works, for which, unfortunately, we have not space.

M. J. DE LAMBALLE is the author of a memoir on the formation of callus on bones, in which he discusses the various theories which have been invented to account for its existence. The ancient and Ambrose Paré supposed that the fragments were reunited by means of an osseous juice, which exuded from the bone or from the capillary veins. Keide, Macdonald, John Hunter, and others considered that the blood which surrounded the fragments passed first through successive transmutations to arrive first at the cartilaginous, then at the osseous state, and that the broken edges were united by a kind of ring formed around them. Haller, Dethleeg, Camper, Troja, Callisen, John Bell, Delpech, Miescher, and other observers presupposed a flowing out of an organised juice, which was converted first into cartilage, then into bone. Duhamel, Fougereux, Dupuytren, Cruveilhier, and Flourens consider that the callus is formed at the expense of the periosteum and of the medullary membrane. The facts of the case are criticised by M. de Lamballe, and their compatibility with these theories considered. No general result is arrived at in his paper, whilst the arguments in favour of the fourth theory appear to be those which the author wishes his readers to accept.

SCIENTIFIC CORRESPONDENCE.

THE MARE SMYTHII,
Synonyma "Kästner" Schröter.
To the Editor of THE READER.

Sir,—May I solicit the attention of your astronomical readers, especially those who take an interest in lunar matters, to the general accuracy with which some portions of the moon's disc have been delineated by the astronomer of Lillenthal, Schröter, towards the close of the last century.

On the 25th of November last I had an opportunity of verifying by direct observation a drawing made by Schröter of a portion of the moon's disc in the equatorial regions very near the western limb. It was that of a large lunar mare, or so-called "sea," extending over about 15 degrees of latitude—viz., from 5° 30' N lat. to 9° S. lat.—and is found in his "Selenotopographische Fragmente," T. lix., fig. 1. It does not appear that Schröter recognised this as a mare, as he gave it the name "Abraham Gotthelf Kästner." The drawing has numerous formations and craters both east and north of the large plain forming the principal object, particularly an extensive crater which he called "Neper," north of the plain, and only separated from it by a small crater of about a quarter of the length of "Neper." These I found very accurately delineated; and the instances were very few indeed in which I noticed even a small departure from the appearance of the surface of the moon itself. The only difference of much importance consisted of some additional features which I saw, and which Schröter has not depicted. The date of Schröter's drawing is 1792, Sept. 30, 22 hours after full moon.

The opportunities for observing this portion of the lunar disc are rare. I first saw it (as noticed in THE READER, No. 43, p. 478, col. 3) on August 20, 1861, and could find no traces of it in Beer and Mädler's map. I found, indeed, a dark crater, "Kästner," very unlike the formation I witnessed, but agreeing in some respects with a depression east of the south part of the large plain. I also noticed that the crater "Neper" is placed on the map at a considerable distance from the north end of "Kästner." Not being able to find anything agreeing with what I saw on their map, I fully concluded that Beer and Mädler had in some way overlooked this magnificent "mare," and I treated my own observations in the light of a discovery, until the Rev. T. W. Webb kindly called my attention to the drawing in question; and I am happy to give my testimony to the care and fidelity with which Schröter has treated this portion of the moon.

In the absence of my knowledge of Schröter's work, the name "Smythii" has been given to this mare (see ante, p. 478, col. 3), and it appears desirable to retain it, as the spot in question clearly ranks as a mare, and the name "Smythii" is applicable on several accounts.

I am, Sir, your obedient servant,

W. R. BIRT.

Victoria Observatory, Victoria Park,
London, December 1, 1863.

PROCEEDINGS OF FOREIGN ACADEMIES.

Academie des Sciences, Paris.—THE following papers and communications were read:—H. Sainte-Claire Deville and Troost—"Upon the Permeability of Iron at a High Temperature." Pasteur—"On M. Beclamps' Claim of Priority on the subject of Fermentations and Spontaneous Generation." Admiral Paris—"Remarks upon Iron-Clad Ships." Tulasme presented, on behalf of his brother and himself, the second volume of their "Fungorum Carpologia." Isid. Pierre—"Remarks and Practical Observations on the Corn Returns for 1863." Cadiot—"Upon the Effect of Consanguineous Alliances." Triger—"On the Railways from Paris to Rennes and Tours to Mans, viewed as Geological Sections." Blanner—"Remarks on a Preceding Communication from M. Anacapitaine upon the Isle of L'Etang de Diane." Kosmann—"On the Relative Quantities of Ozone in Plants and Atmospheric Air during 1863." Niene—"Upon the Scoria produced in Puddling Operations." Freytag—"On the Calculation of Sines." Champouillon—"On some Effects resulting from the use of Sugar and Saccharine Remedies." Dumas—"Letter concerning the Use of the New Railway Breaks." Nourrigat—"On the Advantage of the Culture of the Wild Mulberry-Tree over the Cultivated Tree." Nauck—"On Resolving Numerical Equations of the Third Degree." M. Pimont presented some certificates stating the good results which have been obtained by the use of his invention called *colorifuge plastique*. Schiff—"Upon Colouring Matters derived from Naphthylamine." Berthelot—"Remarks Relative to the Action of Oxygen upon Wine." Berthelot—"Reply to a Paper by M. Maumené upon the Distillation of Mixed Liquids." Friedel and Crafts—"Upon the Production of Ether Mixed with 'Ethyl-amylque' and upon 'Etherification.'" Maumené—"On Unsweetened Diabetic Urine." Thomas—"Upon the Analysis of the Amalgam of Silver and Lead." Basset—"Reclamation of Priority concerning some facts relative

to the Theory of Spontaneous Generation." Hement—"Remarks on M. Berthelot's Experiments on the Mixture of Gases." M. Cabien asked and obtained permission to withdraw a paper "On the Waters of Paris." M. Jobert de Lamballe presented on behalf of the Section of Medicine and Surgery, the following lists of candidates for the place of Correspondent, vacant by the death of Sir B. Brodie:—1st. M. Laurence; 2nd. Messrs. Rokitanaky and Simpson. M. Naudin was elected a member of the Botanical Section in the place of the late M. Moquin-Tandon. A commission was appointed to propose a new question for the grand Mathematical Prize for 1864—Commissioners: Messrs. Bertrand, Charles, Serret, Bonnet, and Hermite. The President presented, in the name of M. Van Dromme, a paper "On the Curative and Preventative Treatment of Asiatic Cholera." The perpetual Secretary pointed out among the presents the "Cognissance des Temps" for the year 1865, and the annuaire of the "Bureau des Longitudes" for the year 1864, the first seventy-six sheets of "The Roman Flora," by M. Sangumetti, and a pamphlet upon "Organic Substitutions," by M. Courty. M. Silvester, lately appointed to a situation as Correspondent to the Geometrical Section, returned his thanks to the Academy.

LEARNED SOCIETIES.

Ethnological Society, Dec. 22nd. J. Crawford Esq., F.R.S., President, in the chair.—Mr. GALTON, F.R.S., read a paper on the "Domestication of Animals," from which we are enabled to lay the following extracts before our readers:—"The domestication of animals is one of the few relics of the past whence we may justly speculate on man's social condition in very ancient times. We know that the domestication of every important member of our existing stock was originated in pre-historic ages, and, therefore, that our remote ancestors had accomplished, in a variety of cases, what we have been unable to effect in any single instance. The object of my paper is to discuss the character of ancient civilization, as indicated by so great an achievement. Was there a golden age of advanced enlightenment? Have extraordinary geniuses arisen who severally taught their cotemporaries to tame and domesticate the dog, the ox, the sheep, the hog, the fowl, the camel, the llama, the reindeer, and the rest? Or again, is it possible that the instincts of savages, combined with the qualities of the animals in question, may have sufficed to originate every instance of established domestication? It is to be presumed, in the first place, that animals would be originally domesticated in lands where they abounded in a wild state, and where the natives were skilled in capturing them. Unless the animals were easily obtainable we could hardly expect a sufficient number of experiments to have been made to yield a successful result. If they had been rare in all places and at all times they would *ipso facto* be disqualified for domestication; for animals must be hardy and able to multiply freely under varying circumstances, else they would be of no importance as a domestic breed. Secondly.—It is a fact familiar to all travellers that savages frequently capture young animals of various kinds, and rear them as favourites, and sell or present them as curiosities. Human nature is generally skin; savages may be brutal, but they are not on that account devoid of our taste for taming and caressing young animals; nay, it is not improbable they may occasionally possess it in a more marked degree than ourselves, because it is a childish taste with us; and the motives of an adult barbarian are very similar to those of a civilized child. The traveller Hearne, who wrote towards the end of the last century, relates the following story of moose or elks in the more northern parts of North America. He says, 'I have repeatedly seen moose at Churchill as tame as sheep, and even more so. . . . The same Indian that brought them to the factory had, in the year 1770, two others so tame that, when on his passage to Prince of Wales's Fort in a canoe, the moose always followed him along the bank of the river; and at night, or on any other occasion when the Indians landed, the young moose generally came and fondled on them, as the most domestic animal would have done, and never offered to stray from the tents.' Sir John Richardson, in an obliging answer to my inquiries about the Indians of North America, after mentioning the bison calves, wolves, and other animals that they frequently capture and keep, says:—'It is not unusual, I have heard, for the Indians to bring up young bears, the women giving them milk from their own breasts.' He mentions that he

himself purchased a young bear, and adds, 'The red faces are fond of pets and treat them kindly; and in purchasing them there is always the unwillingness of the women and children to overcome rather than any dispute about price. My young bear used to rob the women of the berries they had gathered, but the loss was borne with good-nature.' Mr. Mansfield Parkyns, who passed many years in Abyssinia and the countries of the Upper Nile, writes me word—'I am sure that negroes often capture and keep alive wild animals. I have bought them and received them as presents—wild cats, jackals, panthers, the wild dog, the two best lions now in the Zoological Gardens, monkeys, innumerable and of all sorts, and mongoos. When I was on the White Nile and at Khartoum very few merchants went up the White Nile; none had stations. They were little known to the natives; but none returned without some live animal or bird which they had procured from the natives. That the capturing of animals was a very ancient custom may be read from the tombs of the kings in Egypt, where naked negroes from the south are bringing presents to the Pharaoh, among which are various wild beasts.' On the West African Coast there is a busy trade in live birds and monkeys. In Dr. Murie's recent journey in company with Mr. Petherick by the side of the White Nile, young live animals were frequently brought to their camp for sale. In Central Africa, as at Kouka, antelopes and ostriches are both kept tame; so I am informed by Dr. Barth. There are instances in Africa where other motives induce the natives to protect and partly tame animals, besides that of caressing them. Serpents of large size, and I know not what other creatures, are held sacred in the delta of the Niger and elsewhere. They go about the villages with impunity and are fed by the people. The most remarkable instance of all is the account by Captain Speke of a menagerie that existed up to the beginning of the reign of the present king of the Wahumas, on the shores of Lake Nyanza, which was first established some centuries ago. It reminds us of the great menageries of the ancient Mexican kings, of those of Assyria, and of our own Zoological Gardens. Mr. Wallace, the distinguished naturalist and traveller, says, 'In the interior of South America the Upas Indians rear great numbers of birds and monkeys. The women carry the monkeys continually on their heads when very young, and even suckle them; the only way in which many kinds can be reared.' It will be found on enquiry that few travellers have failed altogether to observe instances of wild animals being nurtured in the encampments of savages. If we consider the small number of encampments they severally visited in their line of march, compared with the vast number that are spread over the whole area, which is or has been inhabited by savages, we may obtain some idea of the thousands of places at which half-unconscious attempts at domestication are being made in each year. These thousands must themselves be multiplied many thousand-fold, if we endeavour to calculate the number of similar attempts that have been made since men like ourselves began to inhabit the world. I conclude from what I have stated that there is no animal worthy of domestication that has not frequently been captured, and might ages ago have established itself as a domestic breed, if it had not been deficient in certain necessary particulars which I shall proceed to discuss. It by no means follows that because a savage cares to take home a young fawn to amuse himself, his family, and his friends, that he will always continue to feed or to look after it. Such attention would require a steadiness of purpose foreign to the ordinary character of a savage. But herein lie two shrewd tests of the eventual destiny of the animal as a domestic species.

"*Hardiness*.—First, it must be able to shift for itself and to thrive, although it is neglected; since, if it wanted much care, it would never be worth its keep.

"*Fondness for Man*.—Secondly, it must cling to man, notwithstanding occasional hard usage and frequent neglect. If the animal had no natural attachment to our species, it would fret itself to death, or escape and revert to wildness. It is interesting to note the causes that conduce to a decided attachment of certain animals to man, or between one kind of animal and another. It is notorious that attachments and aversions exist in nature. Swallows and storks frequent dwelling-houses; zebras and gnus herd together; so do bisons and elks. On the other hand, deer and sheep, which are both gregarious, and both eat the same food and graze within the same enclosure, avoid one another. I presume that two species

of animals do not consider one another companionable, or clubable, unless their behaviour and their persons are reciprocally agreeable. A phlegmatic animal would be exceedingly disquieted by the close companionship of an excitable one. The movements of one beast may have a character that is unpleasant to the eyes of another; his cries may sound discordant; his smell may be repulsive. Two herds of animals would hardly intermingle, unless their respective languages of action and of voice were mutually intelligible. The animal which, above all others, is a companion to man is the dog, and we observe how intelligible their proceedings are to each other. Every whine or bark of the dog, each of his fawning, savage, or timorous movements is the exact counterpart of what would have been the man's behaviour had he felt similar emotions. As the man understands the thoughts of the dog, so the dog understands the thoughts of the man, by watching his voice, his countenance, and his actions. A man can irritate a dog by laughing at him, he can frighten him by an angry look, or calm him by a kindly bearing; but he has less hold over an ox or a sheep, and none at all over many other animals. Who, for instance, ever succeeded in frowning away a mosquito, or in pacifying an angry wasp by a winning smile?

"The life of all beasts in their wild state is an exceedingly anxious one. From my own recollection, I believe that every antelope in South Africa has literally to run for its life once in every one or two days upon an average, and that he starts or gallops under the influence of a false alarm many times in a day. Those who have crouched at night by the side of pools in the desert, in order to have a shot at the beasts which frequent them, see strange scenes of animal life; how the creatures gambol at one moment, and fight at another; how a herd suddenly halts in strained attention, and then breaks into a mad-dened rush, as one of them becomes conscious of the stealthy movements or rank scent of a beast of prey. Now this hourly life and death excitement is a keen delight to most wild creatures, but must be peculiarly distracting to the comfort-loving temperament of others. The latter are alone suited to endure the crass habits and dull routine of domesticated life. When animals thoroughly enjoy the excitement of wild life, I presume they cannot be domesticated; they could only be tamed, for they would never return from the joys of the wilderness after they had once tasted them through some accidental wandering.

"To proceed with the list of requirements which a captured animal must satisfy before it is possible he could be permanently domesticated, there is the very obvious condition that he should be useful to man; otherwise, in growing to maturity, and losing the pleasing youthful ways that had first attracted his captors and caused them to make a pet of him, he would be repelled. As an instance in point I will mention seals. Many years ago, I used to visit Scotland, when those animals were still common, and I heard many stories of their being tamed: one will suffice.—A fisherman caught a young seal; it was very affectionate, and frequented his hut, fishing for itself in the sea. At length it grew self-willed and unwieldy; it used to push the children and snap at strangers; at last it was voted a nuisance, but the people could not bear to kill it, on account of its human ways. One day the fisherman took it with him in his boat, and dropped it in a stormy sea, far from home; the stratagem was unsuccessful: in a day or two the well-known scuffling sound of the seal as it floundered up to the hut was again heard—the animal had found its way home. Some days after, the poor creature was shot by a sporting stranger, who saw it basking, and did not know it was tame. Now, had the seal been a useful animal and not troublesome, the fisherman would doubtless have caught others, and set a watch over them, to protect them; and then, if they bred freely and were easy to tend, it is likely enough he would have produced a domestic breed.

"An animal may be useful as a domestic animal, and yet the circumstances in which the savages are living may make it too troublesome for them to maintain a breed. Mr. Scott Nind says, 'In the chase the hunters are assisted by dogs, which they take when young and domesticate. After finding a litter of young, the natives generally carry away one or two to rear; in this case, it often occurs that the mother will trace and attack them; and, being large and very strong, she is rather formidable. At some periods food is so scanty as to compel the dog to leave his master and provide for himself, but in a few days he generally returns.' Mr. Galton next considers

the qualities which are likely to render a collection of tamed animals useful in the eyes of a savage, and then gives the following recapitulation of the conditions under which wild animals may become domesticated:—"1, they should abound in a wild state; 2, the natives should be hunters; 3, the animals should be hardy; 4, they should have an inborn liking for man; 5, they should be comfort-loving; 6, they should be found useful to the savages; 7, they should breed freely; 8, they should be gregarious. I believe that every animal has had its chance of being domesticated, and that those which fulfilled the above conditions were domesticated long ago. It would follow as a corollary to this that the animal creation possesses no more animals worthy of domestication, at least for such purposes as savages care for.

"*Elephant*.—An apparent exception to my reasoning lies in the fact that the African elephant is now untamed. Whatever the negroes may have done in ancient times, either for their own purposes or for those of the Phenicians, it is certainly not domesticated, nor even kept alive at the present time. There are probably few bolder elephant hunters than the Africans, but they are not elephant tamers. How is it that the Hindoos domesticate when the Africans do not, if we assume that domestication has always been performed by savages? The answer is easy. I doubt if the first domestication of the Indian elephant took place in savage times, and I am sure that three of my conditions are not fulfilled in Africa. First, elephants are not sufficiently abundant; nor, secondly, is the character of the country such as to admit of their easy capture. Africa is different from Ceylon, where the elephants swarm in dense forests, in which palisades can easily be erected for catching them, and woodbines found for lashing them after they are caught. Africa is on the whole a bare and open country, over which the elephants migrate. There are few places where stockades could be erected with a chance of being used with frequent success. Thirdly, the animal would be useless to savages, especially in Africa. It is mostly a land of upland grassy plains, excellent for oxen, which abound, but not at all suited for elephants, who could only obtain their living by ravaging in the woods. An African who had a young elephant could not maintain it. India is differently circumstanced: there the maintenance of the elephant is easy. Fourthly, no animal is more easily tamed than a young elephant, but he must be watched all his life, for if he escapes into the woods he reverts to absolute wildness. It would be inconsistent with the habits of a savage to tend him with that continuous care. I should explain their domestication in India in this way. Some would be caught young and tamed, others would be captured full grown. The taste of an oriental prince in remote times would be gratified by the monstrous sight of an imprisoned elephant. It would be a spectacle of terror to his people. It would have been as obvious, then as now, to make the huge creature the executioner of men condemned to death. There is as much reason that the frequent capture of elephants should be ordered by an Indian prince for the display of his tyranny, as that a Caffre chief like Dingaan should order his young men to take lions alive. The experience of elephant captors would soon bring to light the curious physiological trait of that animal, which is shared in some degree by the horse, of yielding an abrupt and permanent submission to the man who first vanquished him.

"To conclude, I see no reason to suppose that the first domestication of any animal, except the elephant, implies a higher civilisation among the people who established it than that of barbarian hunters. I cannot believe it to have been the result of a preconceived intention, followed by elaborate trials, to administer to the comfort of man. Neither can I think it arose from one successful effort made by an individual, who might thereby justly claim the title of benefactor to his race; but, on the contrary, that a vast number of half-unconscious attempts have been made throughout the course of ages, and that ultimately, by slow degrees, after many relapses, and continued selection, our several domestic breeds became firmly established."

Professor Owen commented on the paper in very flattering terms; especially praising its suggestiveness, its exhaustiveness, and the elegance of its style. He described the first introduction of the turkey from America, and thought it had become readily domesticated, here, because our ancestors had found it already tamed, if not partly domesticated by the Americans. He then entered into the origin of the cat, and traced it

from a two-fold source; the one, the wild cat, that was spread throughout the north of Europe and of Asia, the other from Egypt. He doubted the author's belief that elephants were more sparse in Africa than in India, because two-thirds of the ivory imported into England came from Africa.

Mr. Poole and Mr. Goodwin both spoke on ancient Egyptian evidences; the former believing the cat to have been first tamed as a sacred animal, and its utility discovered afterwards.

Mr. Wallace mentioned sacred places in the Malay Islands where the squirrels in the trees and the fish in the ponds were also sacred, and consequently very tame.

Mr. Markham said the Indians in the Andes tamed gulls, and were said by old writers to have bred them in large quantities.

Mr. Bates mentioned that the tapir had frequently been tamed in the valley of the Amazon, and that the natives were exceedingly fond of taming birds; they made them ridiculously tame. He added that none of the tamed animals of that part of South America bred in confinement.

Mr. Crawford thought the elephant was not caught or tamed in Africa simply because the negroes were too barbarian and incapable.

Mr. Galton replied that the fact of two-thirds of the ivory being imported into England from Africa did not disprove his assertion of the greater abundance of that animal in its haunts in Asia. African cow-elephants had tusks half the weight of those of the bulls; whereas Asiatic cow-elephants had no tusks at all. A herd of five African beasts—one bull and four cows—would carry three times the weight of ivory of the same number of animals in Asia. Besides this, the African elephant hunter was living on his capital. He was exterminating the beasts to support a current demand. During the last twenty years elephants had been destroyed throughout a frontier land of many hundred miles in breadth, both in the Nile countries and in Southern Africa.

Royal Geographical Society, 14 Dec. Lord Strangford in the chair. THE first paper read was entitled "Notes on the Island of Formosa," by Robert Swinhoe, F.G.S., &c., H.M.'s Vice-Consul at Tai-Wan-Foo, on the island itself.—The island of Formosa is a *foo* or district of the Chinese province of Fokien, and is governed by a special *Taou-Tai*, who may memorialize the throne direct. Mr. Swinhoe doubts whether, owing to its bad anchorage and bad harbourage, Tai-Wan-Foo can ever become a centre of British trade, especially as there are known to be other and far more suitable ports. After marching overland to Tai-Wan-Foo, which is described as girt by a high battlemented wall, six miles in extent, the paper mentioned that the town was fast going to decay owing to the silting up of the river. The difficulty of navigating the coast of Formosa is great, and there are numerous wrecks of vessels that are compelled to run for a port, and are ignorant of several excellent harbours unsurveyed near the south end of the island. On the north-west coast is the Tam-suy river, which Mr. Swinhoe seems to think destined to become the British port of trade, there being sixteen feet of water at high tide over the bar. The capital, Foo-Chow, is not far distant, and there are several natural landmarks for facilitating navigation. The chief danger is from the freshets in the early summer, when the mountain-snows melt. The river in its upper course is formed by two chief branches, near one of which are sulphur mines. Among other improvements effected by native skill is their having, about forty years since, diverted a large stream of water so as to make amends for the very bad water on the plains. There is a wooden aqueduct, five feet deep, eight feet broad, and about 360 feet in length, which has been rendered water-tight with Chinese cement. Not far distant from this the territory of the aboriginal savages inhabiting the east coast is reached, where the division line is strongly marked by the Chinese side being denuded of trees for the cultivation of the tea-plant, while the native side is covered with the usual forest vegetation. Great quantities of rain fall from November to May, making the climate comparatively cold, as is evidenced by a table drawn up with considerable care. This excess of moisture the author attributes to an oceanic stream known as the Kuroshio, which departs at the south cape of Formosa, and extends along its east side and past the eastern shore of Japan, even to the Kurile islands, and is supposed to run for some distance alongside of a much warmer stream coming up from the Philippines.

The Chairman believed the Society would join in echoing the opinion of Mr. Swinhoe that

the Hydrographic Office should take into immediate and serious consideration the unsurveyed state of the coast of Formosa, and especially the fact that, when an appeal was made to the Admiral in command at Hong Kong, he expressed his inability to grant assistance. He thought some suggestion might advantageously be brought to bear upon the Admiralty.

Admiral Collinson said he looked upon Formosa as in some measure a child of his own. In the course of his survey of the Pescadores he occasionally caught glimpses of the far-off island, and availed himself of the opportunity to visit it; he afterwards gave to the great mountain the name of Mount Morrison, a name which he believed all those who were acquainted with our original connexion with the Chinese would acknowledge ought to be perpetuated throughout all ages. After his survey of the Pescadores, on his return to Hong Kong, Sir Thomas Cochrane desired him to go up the east side of Formosa. It was a *terra incognita*. He went round in a little brig, which he commanded, and coasted along in search of a harbour. The coast line was nearly straight; there were no indentations, and the boulders on the shore were so large that they gave some idea of the immense force of the ocean-current which carried them there. The great equatorial current set in on the island in a more wonderful manner than it did in any part of the Atlantic. Off Steep Island, he was carried away one day 91 miles against the wind by the current, and on the following day 103 miles. The whole force of the motion of water given by the equatorial movement through the Pacific Ocean reached the island of Manila; it then flowed up along the island of Formosa, and from thence on to the coast of Japan; but its greatest strength was felt at Formosa and Japan. He had no hesitation in saying that the current would be found to run at the rate of four and a half to five miles an hour. With respect to coal he might state that, finding no anchoring place but the little Sau-o Bay, they went round to Kelung Bay, and in pulling up the river they met with junks laden with coal. It was not known before that coal had been found in this part of the world. He was called to make an examination of it, and he went to the mines, which were about a mile and a quarter from the beach, and found them in a very primitive condition, worked simply by adits. They had no means of lifting, and the only seams which could be worked were those which could be worked from the surface. Whether a seam would be found by sinking was the province of the geologist rather than the nautical surveyor.

Sir Harry Parkes said he was afraid he should scarcely be able to speak upon all the points suggested by the Chairman, for it was rather a complicated and little-known subject. Mr. Swinhoe had rendered good service in drawing attention to an island of immense extent, which was probably as much a *terra incognita* as any other unexplored part of the continent of Asia. It was less a *terra incognita* to Europeans some time ago than it was in the present day, for two centuries ago it was claimed as a European possession. The Dutch occupied it from 1622 to 1662. At that time, wishing to share with the Portuguese and the Spaniards in the trade of the East, they took possession of the Pescadores Islands as a check to Macao on one side, then held by the Portuguese, and on the other to the Philippine Islands, which belonged to the Spaniards. At the instance of the Chinese they relinquished the Pescadores Islands and established themselves on the island of Formosa, which up to that time had not been formally claimed by the Chinese, although separated from them by a channel only ninety-five miles in width. They themselves suggested that the Dutch should take possession of the island. At that time another power, which had lately come into notice, the Japanese, were also located there; and, whenever the Chinese and Japanese came in contact in those days, the Chinese went to the wall. The Japanese followed a very different policy then from that which they pursued now. They were then the adventurers of the East, and they supplied mercenary troops to many Asiatic nations. They had flourishing colonies in the island of Formosa in the fifteenth and sixteenth centuries; and perhaps it was with the politico-intention of setting one race against the other that the Chinese suggested to the Dutch to go there too. However, when the Dutch went there, they found not only the Japanese, but also the Spaniards, and they had to expel both before they became masters of the island. Masters of the island they scarcely continued to be: for, in consequence of the great civil troubles which set in throughout the whole of China in the middle of that century,

swarms of Chinese flocked over into Formosa, against whom the Dutch were scarcely able to contend; until at last a famous piratical chief, who had been strong enough at one time to contend with the Tartars for the empire of the South, was driven from the country, and, crossing over to Formosa, he in turn expelled the Dutch from that island. Following the usual course of events, the pirate himself was eventually subjected to the Chinese government; and, as late as 1682, the Chinese for the first time claimed jurisdiction over Formosa, and incorporated it with their territories. It was now called a *foo*, which was a territorial division, there being no less than 260 divisions in the whole of China. From that time Formosa ceased to be of much importance to the European; and even after our first treaty, though the coasts of China were thrown open to us, yet notwithstanding the attractive name that it bears, Formosa was avoided by sailors and navigators in consequence of the great current flowing up one side of the island of which Admiral Collinson had spoken. There was a similar strong stream running down on the other side, so that it was very difficult for navigators in these days to go by the coast of China, in consequence of the island of Formosa being so much in the way. The South Cape was about the very worst point for a vessel to get on shore; for on that extreme point of the island there was a particular aboriginal tribe, numbering 200 or 300 individuals, who had an unfortunate passion for human heads; and it was a habit with them to murder any foreigner that came in their way. He had occasion to make the acquaintance of these people about twelve years ago, when one of our vessels was lost on that point, and he was sent over by her Majesty's Government to make some inquiries respecting the missing crew. They succeeded in rescuing two of the men, who were in the hands of another tribe on the western point, the wreck having taken place on the eastern point. These two men had been bought by the Chinese at six dollars a head, and had been in captivity with them six months. The South Cape had always proved dangerous to us. Two other vessels, the *Nerbuddah* and the *Ann*, were both wrecked there: one in coming down from China, and the other in going up, in consequence of the strong oceanic currents which prevailed on the coast. That was in the year 1842; and, although the crews of those two vessels did not fall into the hands of savages, but into the hands of the Chinese proper, they were treated in no better way; for, out of a crew of 240 on board the *Nerbuddah*, two only remained with their lives, and out of fifty-seven which formed the crew of the *Ann*, ten only remained—the others having been taken to the capital of Formosa, and, after being kept in captivity there, murdered in cold blood. This was the character which Formosa bore to us: wrecks in the north and south, judicial murders on the part of the Chinese, and bloody murders made by the aboriginal tribes. We had now turned over a new page in the history of our communications with Formosa. The opening of the island to British commerce was one of the last acts which that great British nobleman Lord Elgin, whose loss we now deplore, had accomplished by the treaty which he made with the Chinese. Regarding Formosa as a colony, certainly in one sense it was a colony of China, though a very great portion of it still belonged to the aboriginal tribes; and it was worthy of notice that in the island were found impinging upon each other the remnants of very distinct races of men. To take three parts, one was inhabited by the Chinese, another by the Malay, and the last by Japanese. In other parts it was difficult to say by what race it was possessed: some people were of Malay origin, and some of Polynesian; while still further north Mr. Swinhoe would say that the natives belonged to the aboriginal races of China. The island was very interesting in an ethnological point of view, because we had those distinct traces of different races of people. He was not surprised that Admiral Collinson did not find in the pictures of the aborigines presented to the meeting any very strong resemblance to his friends in Blackrock Bay, because he believed in that part of the country there were various races who were distinct from each other; certainly, those he saw were not so good-looking or so attractive as those which were represented in the pictures, who probably came from the northern part of the island. At present the island presented two different aspects, the western and the eastern one: the western one prosperous and commercial, the eastern one wild and still occupied by savage races; and Admiral Collinson stated that he found