result of selective influence, but apparently the direct effect of the environment.

A RECENT number of the *Bulletin de la Société de Géographie* contains a paper by M. Edouard de Sainville on his sojourn on the lower course of the Mackenzie River between 1889 and 1894. A descriptive account of the region and its Indian and Eskimo inhabitants is given in some detail. Amongst other observations of interest, M. de Sainville notes the entire absence of phthisis among the natives, and the occurrence of colds only on contact with civilisation. The experiment was tried of opening a soldered zinc case from Winnipeg in a perfectly healthy camp, and distributing the contents; next day every member developed a violent cold, which was cured by the administration of camphor.

Bulletin No. 162 of the Michigan State Agricultural College Experiment Station is devoted entirely to the subject of forestry, one of very great practical importance to the State.

THE *Bulletin* of the Illinois State Laboratory of Natural History publishes a list, by Mr. Adolph Hempel, of the Protozoa and Rotifera found in the Illinois river and adjacent lakes at Havana, Ill. In the Protozoa are included *Volvox* and other allied forms. We have received also the Biennial Report, by the director of the same State Laboratory.

IN view of the encouragement of new industries in the tropical possessions lately acquired by the United States, the U.S. Department of Agriculture (Division of Botany) has issued, in the form of *Bulletin* No. 21, an account, by Mr. S. J. Galbraith, of the culture of Vanilla, as practised in the Seychelles Islands.

IN an article in the *Journal* of the Royal Horticultural Society for January, on the "Origin of Species-inducing Varieties," the Rev. G. Henslow states his conviction that it is not a rich soil which first induces doubling in plants, but a poor one; but, let the doubling be once thoroughly set up in the plant's constitution, and it then seems that a rich soil will probably enhance it. We have received also, from the Royal Horticultural Society, a very full programme of arrangements for the year 1899.

THE December (1898) issue of *Himmel und Erde* contains an interesting article, by Herr G. A. L. Rumker, on the photography of lightning, which is illustrated by a beautiful reproduction from a photograph of "ribbon" lightning obtained at the Hamburg Observatory. Dr. F. Koerber continues his article on spectrum analysis, treating of the spectra of the planets and their satellites.

THE *Verhandlungen* of the German Zoological Society, containing reports, papers, and other communications presented to the eighth annual meeting held at Heidelberg last June, have been published by Mr. W. Engelmann, under the editorship of Prof. Dr. J. W. Spengel.

MR. J. A. HARVIE-BROWN has sent us a copy of his paper, read at the International Congress of Zoology last August, on "a correct colour code, or sortation code in colours, to serve for mapping the zoo-geographical regions and subregions of the world, and also to be of use as an eye-index for librarians." Accompanying the paper are specimens of colours which it is suggested should be used for book-shelves or bindings to indicate, in accordance with the proposed code, the regions to which the works refer.

PROF. H. OSBORN has just published a useful pamphlet on the "Hessian Fly (*Cecidomyia destructor*, Say) in the United States," forming *Bulletin* No. 16, new series, of the U.S. Department of Agriculture, Division of Entomology. It is accompanied by a map of the distribution of the insect in the States, and several illustrations of its various stages, parasites, &c. Its original habitat is unknown, but it is now found in most countries of Europe, being specially abundant and destructive towards the eastern parts; in the north and west (including England) it is rarely destructive, and appears to have been either overlooked, or to be of recent introduction. In the States, it first attracted attention in Long Island in the year 1778, and was supposed to have been introduced, a year or two before, with fodder or bedding with the Hessian troops, whence its popular name; and this belief Prof. Osborn considers to be not improbably correct. From Long Island the insect extended its ravages in all directions at the rate of about twenty miles per year, and, as shown by the map, it has now invaded the whole of the eastern half of the States, except the south-eastern and the extreme southern States; and has likewise been found in California, about San Francisco. Outside Europe and the States it has been found near Wellington, New Zealand, in 1888, only two years after its presence in England had been verified by entomologists.

THERE are other wheat midgets besides the Hessian Fly, but the characteristic symptom of the attacks of the latter is the breaking down of the stalk, owing to its being weakened by the grub domiciled within. If the stubble, chaff, &c., is burned, or the field deeply ploughed over as early as possible, future injury may be much minimised, if not altogether prevented. The fly chiefly attacks wheat, rye, and barley, but has occasionally been found on grasses. Its abundance, or otherwise, depends much on climatic conditions, and is liable to be reduced by numerous parasites, chiefly small *Hymenoptera*. These, as well as the life-history of the insect, are fully discussed in the pamphlet referred to in the present note, which also includes a full account of the various remedies which have been suggested for its attacks, and a bibliography.

THE additions to the Zoological Society's Gardens during the past week include a Guinea Baboon (*Cynocephalus sphinx*, ♀) from Africa, presented by Mrs. Mellin; a Macaque Monkey (*Macacus cynomolgus*, ♂) from India, presented by Mr. Hamilton Baker; two Night Herons (*Nycticorax griseus*), European, presented by Mr. Chas. Humberset; a Woodcock (*Scolopax rusticula*), European, presented by Captain Bewicke; two Black-necked Lizards (*Agama atricollis*) from Natal, presented by Mr. W. Champion; a Bennett's Wallaby (*Macropus bennetti*) from Tasmania, an Australian Cassowary (*Casuarius australis*) from Australia, a Two-wattled Cassowary (*Casuarius bicarunculatus*) from the Aroo Islands, a Bennett's Cassowary (*Casuarius bennetti*) from New Britain, deposited; a Brush-tailed Kangaroo (*Petrogale penicillata*, ♀) from New South Wales, a Blue-crowned Parrakeet (*Tanygnathus luzonensis*) from the Philippines, four Bearded Titmice (*Panurus biarmicus*, 2 ♂, 2 ♀), European; two Long-tailed Grass Finches (*Poëphila acuticauda*, ♂ ♀) from North-west Australia, a Hobby (*Falco subbuteo*) British, purchased.

OUR ASTRONOMICAL COLUMN.

WOLF'S COMET, 1898 IV.—A. Thraen gives, in the *Astronomische Nachrichten*, an ephemeris for observation of this comet (Bd. 148, No. 3544).

Ephemeris for Berlin Midnight.

1899.	α. h. m. s.	δ. ° ′	Br.
Feb. 16	6 13 48	−10 39·0	0·80
20	14 39	9 55·2	·74
24	15 53	9 11·6	·69
28	17 28	8 28·9	·64
Mar. 4	19 24	7 47·3	·59
8	21 39	7 6·9	·55
12	24 11	6 27·9	·51
16	27 0	5 50·5	·47
20	6 30 4	−5 14·8	0·44

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During the period the comet moves in a north-easterly direction, its path lying about midway between the belt of Orion and Sirius. From March 8 to 10 it will be passing near the fourth mag. double star β (11) Monocerotis.

COMET CHASE, 1898 VIII.—E. F. Coddington gives, also in *Ast. Nach.*, No. 3544, a revised ephemeris and table of elements for this comet, which he has computed from observations made by him at Mount Hamilton on November 23, December 7 and December 16, 1898.

Elements.

T = 1898, Sept. 20·15344 G.M.T.

$\omega = 4^\circ\ 37'\ 59''.9$
$\Omega = 95\ 51\ 35.9$ } 1899·0
$i = 22\ 30\ 20.3$

$\log q = 0.358892$.

Ephemeris for Greenwich Midnight.

1899.	α.	δ.	Br.
	h. m. s.	° ′ ″	
Feb. 16 ...	11 3 0·99 ...	+36 47 38·3 ...	0·91
20 ...	11 0 58·16 ...	37 15 10·3 ...	·87
24 ...	10 58 49·87 ...	38 16·7 ...	·83
28 ...	56 39·81 ...	56 47·8 ...	·79
Mar. 4 ...	54 31·44 ...	38 10 40·0 ...	·75
8 ...	52 28·31 ...	19 50·9 ..	·71
12 ...	50 33·54 ...	24 26·6 ...	·67
16 ...	48 50·19 ...	24 32·9 ...	·63
20 ...	47 20·60 ...	20 25·6 ...	·59
24 ...	46 6·59 ...	12 20·8 ...	·55
28 ...	45 9·42 ...	38 0 36·7 ...	·51
April 3 ...	10 44 16·87 ...	+37 36 49·3 ...	0·48

Comparison of the elements leads to the orbit being considered almost parabolic, and hence there is no probability of its being identical with that of Comet 1867 I., as has been suggested. The comet is now rapidly receding from the sun and decreasing in brightness. It is moving slowly westwards between the pairs of stars γ, ξ and $\lambda\ \mu$ Ursæ Majoris.

VARIATION OF SPECTRUM OF ORION NEBULA.—Much has been recently said as to whether the spectrum of this nebula is different in different regions. There seems to be no doubt that in different parts certain lines are intensified or reduced relatively to others, but observers are not yet agreed as to the reality of the difference, many ascribing it to physiological causes. Prof. J. E. Keeler, with the Lick 36-inch refractor, has examined it with reference to this matter (*Ast. Nach.*, No. 3541). Near the star Bond 734 the strongest line was Hβ (F). With the slit on the Huyghenion region, near the trapezium, the strongest line was the chief nebula line (λ 5007), while Hβ and the second nebula line (λ 4959) were about equally bright, but much less intense than the chief line. Still keeping the slit in this region, the vertical aperture of the spectroscope was diminished without altering the resolving power. When the brightness was sufficiently reduced, Hβ and the line λ 4959 disappeared, leaving λ 5007 alone visible. Thus in one part of the nebula Hβ alone was visible, in another λ 5007. This is inexplicable on physiological grounds, and would seem to point to real differences in the composition of the nebula.

LATITUDE DETERMINATION.—In the determination of latitude by Talcott's method, the apparent mean declination of a pair of stars has to be deduced from observations of the star corrected by constant factors dependent on the position of the stars. To facilitate these reductions H. Kimura, of the Tokyo Observatory, gives formulæ and tables for constructing mean star factors (*Ast. Nach.*, Bd. 148, No. 3541). There are also four special tables of these constants given for the particular latitude $\phi = 39^\circ\ 8'\ 10''$, which is that chosen for a number of stations for the coming international work of determining latitude variation.

LYNN'S "REMARKABLE COMETS."—A new edition—the seventh—of this handy little volume has been published by Mr. Edward Stanford. The periodic comets which may be expected to return this year are stated by Mr. Lynn as follows: Spring—The comet of 1866, connected with November meteors (period, 33⅓ years). Summer—Tuttle's comet (period, 13¾ years), Tempel's second periodical comet (period, 5¼ years), and Holme's comet (period, nearly 7 years). Winter—Finlay's comet (period, 6½ years).

THE THEORY OF THE STASSFURT SALT DEPOSITS.

"THE formation of the salt deposits at Stassfurt, Wieliczka, and other places, so far as they are of an oceanic origin, cannot receive a detailed explanation until the conditions of equilibrium affecting the salts dissolved in sea-water have been subjected to a systematic investigation.

"First of all, it must be ascertained what grouping the radicals assume in the solid state; that is to say, what solid substances separate out as sea-water is evaporated. Further experiments will then show us how the composition of sea-water is affected by the presence of the various solids, and whether, and to what degree, changes take place—loss of water of crystallisation, formation of double salts, and kindred phenomena—as the composition of the solution alters, until finally the water is wholly evaporated, and a stable system of solids is left behind."

The comprehensive programme of work thus indicated by Dr. Meyerhoffer in 1895 has been seriously entered upon, and the first instalment of results appears in a recent number of the *Zeitschrift für Physikalische Chemie*, vol. xxvii. p. 75.[1]

The investigation promises to be of great interest and importance, viewed both from the theoretical and practical standpoints. The problem of determining the conditions under which a series of salts have been deposited during the concentration of a dilute solution, is very much more complicated than might at first sight appear, and can only be solved by the application of methods and principles that are of recent discovery. The researches that render the investigation possible have been mainly conducted during the past few years in the laboratory of Prof. van 't Hoff; and those who are acquainted with the admirable "Études sur les equilibres chimiques" (translated into English by Dr. Ewan), and with the later publications of van 't Hoff, will know how ably he has developed the theory of equilibrium as applied to the existence of hydrates and of double salts.

The plan of work, with respect to the Stassfurt deposits, is as follows. The chief dissolved substances in sea-water consist of salts formed from Cl, SO_4, Na, K and Mg; the first problem is, therefore, the complete investigation of the salts and solutions producible from these radicals. Even within these limits the investigation is too complicated; so that, first of all, systems formed by water with the chlorides and sulphates of K and Mg are dealt with. Then the consideration is extended to such systems with the addition of rock salt, and the first part of the investigation is concluded.

In the second part the less soluble and less abundant components of the deposits will be considered. Calcium, in the first instance, will receive attention; and then the compounds of boron, bromine, and iron.

The groups of substances to be dealt with are as follows:—

(1) Group formed from the sulphates and chlorides of K and Mg.
$MgCl_2$ and its hydrates.
Sylvine, KCl and K_2SO_4.
$MgSO_4$ and its hydrates; Carnallite, $MgCl_2$, $KCl.6H_2O$.
Schönite, $MgSO_4$, $K_2SO_4.6H_2O$, and potassium astrakanite $MgSO_4$, $K_2SO_4.4H_2O$.
Kainite, $MgSO_4$, $KCl.3H_2O$, and Langbeinite $2MgSO_4$ K_2SO_4.

(2) With the addition of NaCl.
NaCl and Na_2SO_4 and their hydrates.
Astrakanite (Blödite), $MgSO_4$, Na_2SO_4, $4H_2O$.
Glaserite (Penny's salt), $K_3Na(SO_4)_2$.

(3) With the addition of Calcium.
$CaCl_2$ and its hydrates.
Tachydrite, $CaCl_2.2MgCl_2.12H_2O$.
Gypsum, $CaSO_4.2H_2O$, Anyhdrite $CaSO_4$, and their double salts, such as Krugite, Glauberite, Polyhalite, Syngenite, Mamannite, &c.

(4) With the addition of Boron, Bromine and Iron.
Boracite, Stassfurtite.
Magnesium bromide.
Potassium ferrochloride, &c.

The first instalment of the research, now published, deals exclusively with the hydrates of magnesium chloride. The

[1] Über Anwendungen der Gleichgewichtslehre auf die Bildung oceanischer Salzablagerungen, mit besonderer Berücksichtigung des Stassfurter Salzlagers. Von J. H. van 't Hoff und W. Meyerhoffer.

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