

less ones be diverse without any strongly preponderating element, it is impossible to foresee the character of the embryo, just as it is impossible to foresee the character of a handful chosen from an urn containing a mixed assemblage of variously coloured balls. But if they be not diverse, then the embryonic elements will be a true sample of the structureless ones, the conditions of purity of blood are fulfilled, and the offspring will resemble its parents.

We also see, in the process by which the embryonic elements are obtained, how the curious phenomenon may occur of inheritance occasionally skipping alternate generations. The more that has been removed from the structureless group for the supply of the embryonic (which as we have seen, in a nearly sterile destination) the less remains for the latent group, too little, it may be, to assert itself by that, the only prolific, line of transmission. In the supposed case it would recuperate itself during the succeeding generation, where the elements in question will have remained wholly latent, owing to their insignificance in the structureless stage of that generation, which would be sufficient to secure any portion of it from selection for the embryonic form.

It is in the stage of development where I presume those influences to come in, which cause domesticated animals, when turned loose, to become feral. No variety can be stable unless the conditions of development concur to maintain the structureless stages of consecutive generations in an unchanged form. It is clearly of no avail to a breeder to obtain a stock by continued and careful selection, that shall conform to a desired type, if the animals be afterwards reared under other conditions, by which the subsequent stages, both latent and patent, shall be modified.

Lastly, it is in the process of selection of elements, both latent and patent, from the adult parents for the structureless stage of the next generation, where I suppose the curious and unknown conditions usually to occur, through which a change in the habits of life, after the adult age has been reached, is apt to produce sterility. I may be permitted to remark, hypothetically, that this view appears to be corroborated by the fact, that many grains of pollen or many spermatozoa are required to fertilise each ovum, because, as it would seem, each separate one does not contain a sufficiently complete representation of the primary elements to supply the needs of an individual life, and that it is only by the accumulation of several separate consignments (so to speak) of the representative elements, that the necessary variety is ensured. I argue from this that there is a tendency to a large individual variation in the constituents of each grain of pollen, or spermatozoon, and, by analogy, that there is a similar though smaller tendency in each ovum. Also, that changes in the habits of life may increase this variation to a degree that involves sterility.

One result of this investigation is to show very clearly that large variation in individuals from their parents is not incompatible with the strict doctrine of heredity, but is a consequence of it wherever the breed is impure. I am desirous of applying these considerations to the intellectual and moral gifts of the human race, which is more mongrelised than that of any other domesticated animal. It has been thought by some that the fact of children frequently showing marked individual variation in ability from that of their parents, is a proof that intellectual and moral gifts are not strictly transmitted by inheritance. My arguments lead to exactly the opposite result. I show that their great individual variation is a necessity under present conditions, and I maintain that results derived from large averages are all that can be required, and all we could expect to obtain, to prove that intellectual and moral gifts are as strictly matters of inheritance as any purely physical qualities.

## SOCIETIES AND ACADEMIES

LONDON

Chemical Society, June 20.—Dr. Frankland, F.R.S., president, in the chair. The president announced that Mr. Hyde Hills had given ten guineas to the fund for promoting original research, and promised to further increase the donation by ten guineas for each ninety subscribed for the same purpose.—Mr. H. Deacon, on "Deacon's Method of Obtaining Chlorine, as Illustrating some Principles of Chemical Dynamics." The process consists in passing a heated mixture of air and hydrochloric acid over sulphate of copper, or over pieces of pumice or brick saturated with the same. He finds that the action is essentially a surface action, and that there is a certain comparatively small range of temperature, between the critical limits of which the percentage of hydrochloric acid decomposed varies greatly. The

velocity with which the mixed gases pass over the surface of the active material also causes considerable variation in the comparative amount of chlorine produced.

## BOOKS RECEIVED

ENGLISH.—As Regards Protoplasm, new edition: J. H. Stirling (Longmans).

AMERICAN.—The Periodic Law: Rev. G. A. Leakin.

FOREIGN.—Rendiconto dell'Accademia delle Scienze fisiche et matematiche, Naples, 1862-1866 (through Williams and Norgate).—Compendium der physiologischen Optik für Mediciner u. Physiker: Dr. H. Kaiser.

## PAMPHLETS RECEIVED

ENGLISH.—How Fishes Breathe: J. C. Galton.—Influence of Colloids on Inorganic matter: W. Ord.—The Edinburgh Sixpenny 4to. Atlas: W. and A. K. Johnston.—The Insulation of St. Michael's Mount: W. Pengelly.—The Sidereal and Solar Systems: C. C. Clarke.—The Influence of Human Progress on Medical Education: W. Aitken.—Influence of Vaccination, &c., on Mortality from Small-Pox: R. Grieve, M.D.—London Students' Gazette, May.—Annual Address to the Linnean Society: G. Bentham.—Transactions of the Norfolk and Norwich Naturalists' Society, 1872.—Meetings of the Newcastle-on-Tyne Chemical Society, 1871-2.—Journal of the Iron and Steel Institute, vol. i No. 2.—Report of the Astronomer Royal to the Board of Visitors.—Quarterly Journal of the Meteorological Society, vol. i. No. 2.—Journal of Anatomy and Physiology, No. 10.—Proceedings of the Geologists' Association, vol. ii. No. 5.—Tenth Annual Report of the Birmingham Free Libraries Committee, 1871.—Report of Wigan Field Naturalists' Society, 1870-72.—Quarterly Weather Report of the Meteorological Office, Oct. to Dec., 1870.—Devon and Exeter Albert Memorial Museum School of Science and Art; Report for 1872.—Transactions of the Institute of Engineers in Scotland.—Report of Bury Natural History Society, 1872.—On Phonic Coast Fog-Signals: A. Beazley.—Examination of the recent Attack upon the Atomic Theory: R. W. Atkinson.—The Mining Review, vol. i. No. 8.

AMERICAN AND COLONIAL.—The American Practitioner, May 1872.—Reports of the Mining Surveyors and Registrars, Victoria.—Report on the Operations of the Trigonometrical Survey of India, 1870-71: Major Montgomerie.—Second Annual Report on the injurious and beneficial Insects of Massachusetts: A. S. Packard.—Historical Sketch of the *Public Ledger* of Philadelphia: E. H. Munday.—Monthly Record of Observations in Meteorology and Terrestrial Magnetism: R. J. Ellery.—The Projected Science Association for the Natives of India, Mahendra la 'Sircár, M.D.—Report of Progress of Commission of Foreign Forests, Victoria, 1871.—Report of the Entomological Society for Ontario for 1871.—The School Laboratory, vol. ii., No. 1.—The Sun and the Phenomena of the Atmosphere: Prof. C. A. Young.—Fourth Annual Report on the noxious and beneficial Insects of Missouri: C. V. Riley.

FOREIGN.—Atti della reale Accademia dei Lincei, 1871.—Forme delle Pro tuberanze regioni del magnesio e del ferro sulla superficie del Sole: P. Tacchini.—Memorie della Società degli spettroscopisti Italiana, No. 4.—Bulletin de la Société d'Anthropologie, Aug. et Sept. 1871.—Indice degli autori e delle materie della gazetta chimica Italiana, vol. i.—Contribution à une histoire générale et Encyclopédique des Sciences: T. Wechinakof.—La Belgique horticole, Mai et Juin.—Osservazione dell' Eclisse totale: Prof. L. Respighi.—Sull' ultima Eclisse del 12 Dec., 1871: L. Respighi.—The Quarterly German Magazine, No. 3, for 1872.

## DIARY

THURSDAY, JUNE 27.

SOCIETY OF ANTIQUARIES, at 8.30.—Origin of the word Coach: A. Goldsmid.—On the Ruins of Torre Abbey. Miscellaneous Antiquities: Sir W. Tite.

FRIDAY, JUNE 28.

QUEKETT MICROSCOPICAL CLUB, at 8.

MONDAY, JULY 1.

ENTOMOLOGICAL SOCIETY, at 7.

TUESDAY, JULY 2.

SOCIETY OF BIBLICAL ARCHAEOLOGY, at 8.30.—On Israel in Egypt: Dr. H. Haigh.—On the Mazarroth of Job XXXVIII: Henry Fox Talbot, F.R.S.—On the Use of the Papyrus among the Accadians: Rev. A. H. Sayce.—On the Economic Botany of the Bible: James Collins.

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