

In the annual report for 1887 the superintendent gives an interesting statement regarding the game living in the limits of the park:—

"Immense herds of elk have passed the winter along the travelled road from Gardiner to Cook City with the same safety which herds of domestic range cattle enjoy in other localities. Several stacks of hay, which had been placed along this road in anticipation of winter freighting, were appropriated and doubtless enjoyed by these animals. It is difficult to form any accurate estimate concerning the number of elk that passed the winter in the park: certain it is that the number that wintered in the valley of Lamar River and on its tributaries have been estimated by all who saw them at several thousands. The elk are accustomed, when driven out of the mountains by the snows of winter, to follow down the course of the mountain-streams into the lower valleys. For this reason but little efficient protection can be afforded to this species of large game in the park except upon the Yellowstone River and its tributaries.

"The elk which follow down the outward slopes of the mountains surrounding the park, along the tributaries of the Madison and the Gallatin on the west, or the Snake River on the south, pass beyond the park limits before the hunting-season permitted by the territorial laws has closed, and fall an easy prey to the hunters who are in wait for them.

"A small number of buffalo still remain in the park, but, after as careful and thorough an investigation as is practicable, I am unable to state their numbers with any approach to accuracy. My impression is, that they have been heretofore somewhat overestimated, and that at the present time they will not exceed one hundred in number. They are divided into three separate herds. One of these ranges between Hell-roaring and Slough Creeks in summer, well up on these streams in the mountains, outside the park limits; and in the winter lower down, on small tributaries of the Yellowstone, within the park. If the reports made several years ago can be relied on, this herd has rapidly diminished, and it is doubtful if it now exceeds some twenty or thirty in number. Whether or not this decrease has been due to illegal killing by hunters, or to other causes, I am unable to say, though I do not believe that many have been killed within the past two years. Another herd ranges on Specimen Mountain and the waters of Pelican Creek. The herd was seen by reliable parties several times last winter, and was variously estimated at from forty to eighty. A traveller on the Cook City road claimed to have counted fifty-four near the base of Specimen Ridge. A scouting-party which I sent out during the month of May found but twenty-seven head of this herd, with four young calves. It is possible that the herd at this time was broken up, and that but one portion of it was found. The third herd ranges along the continental divide, and is much scattered. A band of nine or ten from this herd was seen several times this spring in the vicinity of the Upper Geyser Basin. It will take close observation for several years to determine with any certainty the number of these animals, or whether or not they are diminishing in numbers. It is practically certain that none have been killed within the park limits during the past two years, and yet there is an equal certainty that the present numbers do not approach those of past estimates.

"Large numbers of antelope are found in the park. A herd of some two hundred passed the winter within a mile of the town of Gardiner, pasturing on the plain between the Yellowstone and Gardiner Rivers, south of the town. They were unmolested, though it was found necessary to occasionally drive them back towards the hills, that they might not get beyond the park limits.

"The mountain sheep are found in all of the mountain ranges within the park. A band of seven or eight spent a large portion of the winter in the cliffs along the travelled road between Mammoth Hot Springs and Gardiner, and they became so accustomed to the sight of travellers as to manifest but little more timidity or wildness than sheep of the domestic variety."

The progress of road-construction in the park has been greatly retarded by the lack of sufficient appropriations. It is greatly to be regretted that the beauties of the park, that, in the words of the statute, has been "set apart as a public park or pleasuring-ground for the benefit of the people," is not rendered accessible in all its

parts to the public by the construction of roads and bridges, the cost of which has been estimated at \$130,000.

It appears that the only method of enforcing the laws and regulations regarding the park is the expulsion of all offenders, there existing no court which has jurisdiction over such cases. The superintendents of the park have for a number of years asked that such a court be established, but so far Congress has not acted upon their suggestions.

It seems, however, on the whole, that the park is well protected from injury, and the steadily increasing number of visitors shows that it has not decreased in attractiveness either to Americans or to foreigners.

#### A NEW SCIENCE OF MIND.

THE authorities of the Collège de France, the representative institution of the higher education in France, have transformed, as already reported in *Science*, the chair of the 'law of nature and of nations' into a chair of 'experimental and comparative psychology.' The significance of this action lies in its calling the 'new psychology' to a co-ordinate rank with the more widely recognized and historically sanctioned sciences. This honor has naturally caused considerable inquiry as to the nature and the objects of the new science; and M. Paul Janet, the well-known writer on ethical topics, undertakes to enlighten his countrymen in this regard ('Une Chair de Psychologie Experimentale et Comparée au Collège de France,' *Revue de Deux Mondes*, April 1, 1888).

M. Janet, with perhaps pardonable patriotism, poses the new psychology as of French origin, but it is really connected with the past by many roots. It is related to the objective study of mind furthered by Hartley and Locke, by Descartes and Cabanis; its welfare has been more essentially secured by the general renaissance of physiological and neurological studies of which the name of Johannes Müller is representative; the modern alienists drew attention to the valuable mine of mental phenomena that disease laid bare; and, after it emerged as an independent study, it willingly acknowledged its indebtedness to physics and physiology, as well as to psychiatry and anthropology, without forgetting its parentage from the psychology of the past, itself the result of a progressive philosophic insight.

The term 'physiological psychology,' though quite generally in use to describe the new movement, really expresses but one, though perhaps the most important and advanced, division of a scientific, or, as M. Janet prefers, an objective psychology. The new psychology, however, is characterized as much by its method, its spirit, as by its contents; and it was for this reason that the chair was called one of 'comparative' and 'experimental' psychology.

Difficult though it is to summarize the various lines of interest that unite workers in the several specialties of the new psychology, the attempt may be useful. From the physiological side, psychology finds that the phenomena with which it is concerned occur in connection with a material organism of an intricate and mysterious construction. The analogues of the acts which we recognize in ourselves as the indices and concomitants of psychic states are unmistakably found in the lower animals. No matter how far down in the scale we descend, we nowhere lose the thread that makes the world akin. "The tendency of modern inquiry," says Mr. Tylor, "is more and more towards the conclusion, that, if there is law anywhere, it is everywhere;" and in the amoeba stretching out its extemporized arm in response to an irritation in its environment, psychology detects a real though remote analogy to that varied and far-sighted adaptation of means to ends that characterizes the life of a high civilization. The problem, then, is to trace the successive stages of this co-ordination of nervous structure with psycho-physiological function; to see reflex act emerging into instinct; to see instinct acquiring more and more adaptability, and sending the young into the world less freighted with the ready-made acquisitions of their ancestors, and freer to shape their lives according to outward conditions, until, in the human infant, nature presents at once the most helpless and the most educable of organisms. This general problem includes many special ones. In ascending the evolutionary scale, the nervous system increases in complexity; the parts become more specialized and more integrated; finer methods of

study are needed; and when we ascend to the highest product of evolution, the cortex of the human cerebrum, we are presented with the most interesting as well as with the most baffling aspect of the problem. A combination of methods, applied with patience and ingenuity, has divested the problem of some of its mystery. By co-ordinating the symptoms during life with the lesions revealed in the post-mortem examination; by exposing the brains of the lower animals to definite injuries, and carefully recording the results; by removing certain sense-organs or other parts in developing animals, and observing the defects of organization in the adult; by utilizing the exceptions that nature presents, — we have acquired a knowledge of the laws of the nervous system that would have seemed Utopian to our fathers, and that has already enabled the surgeon to predict the location of and remove a tumor in the brain.

The study of the senses has acquired a deeper and a richer meaning since the recognition of its place in a forming science has come about. The revolutionary discoveries of Helmholtz, whose success is so largely due to the union of two sciences, have induced others to continue the work in a hundred directions; and as indicative of the promise that these researches hold out, may be cited the conviction of an eminent physicist, Professor Mach, that the next great movement in the progress of science must come from the union of psychological points of view with physical methods and results. A mere mention of the many investigations that owe their origin to the work of Fechner and the formulation of his psycho-physic law must suffice to indicate the great activity in this field, and to justify the title of an experimental psychology. Moreover, the measurements of the time taken up by various psychic processes, the experimental study of memory, of attention, of the association of ideas, of the bilateral functions, of rhythm and the time-sense, of space and time perceptions, and so on, have led to the development of a mass of ingenious apparatus, and have made the psychological laboratory an indispensable requisite for its satisfactory instruction.

Morbid psychology is a rubric of paramount importance to the full and clear comprehension of the phenomena of mind. The genesis of illusions and hallucinations, the perversion of the natural channels of the emotions, the disintegration of the elements of personality, the dissolution of the logical powers, — all these problems transform the apparently wild and chaotic picture of the mad-house into a sad but interesting record of the process of character and of mind building. This interest is heightened by remembering that here lies the key to the understanding of the psychic epidemics that in the past have upset the rationality of mankind, and transformed the incoherent babbling of some demented soul into the mysterious utterances of a revealed spirit. It is furthermore heightened by the notice that the phenomena conveniently grouped as 'psychic research' are attracting, and always will attract. Hypnotism, after an adventurous and uncertain existence in the hands of charlatans, has been admitted into science; and although the literature of the topic, at least in France, is increasing out of all proportion to our insight into the nature of the phenomena, yet enough has been established to recognize in this semi-morbid condition the key to the solution of many otherwise barely accessible problems. With regard to those borderland phenomena, — 'telepathy,' 'clairvoyance,' and the like, — they illustrate the subtleness of the process by which false systems gain success, and demonstrate the advisability of having men who can speak on such topics with the authority of trained experts.

What its votaries have deservedly dignified into the science of 'anthropological psychology' offers a most attractive field for research. The customs and thought-habits of primitive peoples not only record the first stages in the progress that leads to culture, but prevent the formulation of notions that seem true enough when tested by our own civilization, but reveal the provinciality of their origin when applied to more rudimentary conditions of life. Instead of *résumé*-ing the many rubrics that here contribute to the completeness of a scientific psychology, one may refer to the works of Mr. E. B. Tylor as exemplifying at once the attractiveness of the subject, and the value of the results, under a learned and skillful treatment.

If we conclude this survey with the mention of the psychology of the developing child, glimpsing as it does, in the budding capabilities of the infant, the microcosm of the race and an epitome of the

struggle for civilization, it is not because the lines of research have been exhausted, but that, with the scope of the science thus outlined, what remains to be done will probably be suggested by what has been said. The psychology of the infant is not the only point at which psychology and education touch; but everywhere education must refer to psychology, of which, in the highest sense, it is only the practical application.

The movement has not been without its opponents. The cry has been raised that it is not a science, but a mere aggregation of disjointed facts: it shines by borrowed wealth. But the force of this objection is weakened, if we remember that a science maintains its individuality quite as much by the point of view from which it regards its subject-matter as from the nature of the subject-matter itself. It is not an evidence of weakness for one science to borrow from and build upon another; but it testifies to the unity of the phenomena of nature, and reduces the division of the sciences to what they at bottom represent, — the classification of the direction of men's interests. The chaotic condition of the facts with which psychology deals is rapidly disappearing, and it may yet hope to receive a unifying impulse such as Darwinism gave to zoology. It is, at all events, better to have a collection to arrange when the true method of arrangement shall be discovered, than not to collect because the ideal arrangement is not yet at our service.

Again: there are some, who, heedless of the caution of George Henry Lewes, — that the first question is not, "What does it lead to?" but, "Is it true?" — see in the objective study of mind the downfall of idealism, and of all the valuable beliefs that have clustered about it. They stigmatize it as materialistic. This is surely a misunderstanding. The history of the movement does not bear out such an accusation. The men the spirit of whose work is in line with a scientific psychology — Lotze, Helmholtz, Fechner, Wundt — are all of them the very opposite of materialists. The new movement does not attempt to usurp the place held by other studies, except as it is an advance upon them: it does not pose as the only department of philosophic learning. Its professors have fortunately been men of liberal sympathies, and deeply imbued with the historical sense. They do not claim to have created a science entirely new, unique, and undreamt of, but appreciate their development from the past. Their aim is to retain for the study of mental science that high place which has always been accorded it, by making it progressive and abreast of modern learning.

Professor Ribot, in the opening lecture of his course at the Collège de France (*Revue Scientifique*, April 14), taking a bird's-eye view of psychological activity in the various countries of civilization, saw everywhere signs of great promise. The literature is increasing both in value and in quantity. The science has reached the 'monograph' stage. Journals specially devoted to its interests, such as the *Philosophische Studien*, the *Revue Philosophique*, the *Rivista di Filosofia Scientifica*, and our own *American Journal of Psychology*, are flourishing; and laboratories and professorships for the dissemination of its teaching are being established at the leading universities. With the advantages that the youth and plasticity of our educational institutions give them, and the successful examples of the leading universities before them; with the practical ends that the new movement embraces; and with our pushing enthusiasm to have every thing that is new and good, — it seems justifiable to predict for scientific psychology a large and representative following in this country. JOSEPH JASTROW.

#### ABORIGINAL ARCHITECTURE IN THE SOUTH-WEST.

A FIELD-PARTY of the Bureau of Ethnology, in charge of Mr. Victor Mindeleff, has recently returned to Washington, bringing a large amount of new and valuable material. For a number of years past Mr. Mindeleff's investigations have been confined to the architecture of the South-west. One of the most interesting places visited by him during the past season was a group of cave-dwellings situated about eight miles north-east of Flagstaff, Arizona. These ruins had previously been visited by Major Powell and Mr. Stevenson.

The remains occupy the summit of a cinder cone, and extend some distance down the south side. The rooms are numerous,