$$\int_{-1}^{+1} P_4(x)(d/dx)(1-x^2)(d/dx)P_4(x)dx = -40/9$$

$$\int_{-1}^{1} P_4(x)(d/dx)^4(1-x^2)^4 dx = 256/3$$

$$\int_{-1}^{1} (1-x^2)^2\{(d/dx)^2P_4(x)\}^2 dx = 80$$

$$\int_{-1}^{1} (1-x^2)^2\{(d/dx)^3P_5(x)\}^2 dx = 6720$$

$$\int_{-1}^{1} \exp(2x)(1-x^2)^{1/2}P_3(x)dx \quad \text{EXCEPTION}$$

$$\int_{-1}^{1} P_2(x)P_3(x)P_4(x)P_5(x)dx = 0\cdot049950050$$

$$\int_{-1}^{1} x^4(d/dx)^4P_6(x)dx = 1296$$

$$\int_{-1}^{1} x^4 dx = 0\cdot4$$

$$\int_{-1}^{1} \exp(3x)x^4 dx = B_4(3) = 2\cdot64714568$$

$$\int_{-1}^{1} (1-x^2)^{1/2}dx = \pi/2$$

$$\int_{-1}^{1} x^2(1-x^2)^{1/2}dx = \pi/8$$

I plan to use this program for a scattering calculation where the worst integrals are of the type

$$P(L, L', p, j(M)) = \int_{-1}^{1} P_L^M(x)P_{L'}^M(x)P_j(x)P_p(x)dx.$$

The accuracy of the test integrals given by the program is generally seven to eight significant figures, indicating complete satisfaction from the viewpoint of numerical analysis, since the Mercury word-length is only $8\frac{1}{2}$ decimals.

A stratagem of considerable value for integrals with $\alpha = 0$, $\beta =$ even integer is that we may evaluate

$\int_{-1}^{1} f(x)P_j(x)dx = 2A_j/(2j+1)$ for all values of j simply by evaluating

$$\int_{-1}^{1} f(x)dx = 2A_0,$$

since the values of A_j are available.

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References

ERDELYI, A., *et al.* (1953). *Higher Transcendental Functions*, Vol. I, New York: McGraw-Hill, Chapter III.
ERDELYI, A., *et al.* (1954). *Tables of Integral Transforms*, Vol. II, New York: McGraw-Hill.
HOBSON, E. W. (1931). *Theory of Spherical and Ellipsoidal Harmonics*, Cambridge University Press.
PREUSS, H. (1956). *Integraltafeln zur Quantenchemie*, Springer-Verlag, Berlin.
WATSON, G. N. (1944). *Theory of Bessel Functions*, 2nd edition, Cambridge University Press.

Book Review

Administrative Decision Making—A Heuristic Model, by WILLIAM J. GORE, 1964; 191 pages. (London: *John Wiley and Sons Ltd.*, 38s.)

The author contends that most major decisions are heuristic—as opposed to rational—and that the heuristic process may be represented by a model: this he does. He uses heuristic to mean a process of groping towards agreements seldom arrived at through logic. "The very essence of the heuristic process is that the factors validating a decision are internal to the personality of the individual instead of external to it." The greater part of the book is in loose social-science jargon which at times renders precise understanding difficult, e.g. from the glossary of terms we learn that the complex of inter-related goals defining an organization are *Instrumental Goals* for those who live and work within it, but are *Mission Conception* for those served by the organization.

The theoretical framework available to use for interpreting administrative decision-making is so limited that all contributions are to be welcomed. Many will be unable to accept this book's fundamental precepts, many will find the terminology difficult, many will question the validity of the models, but anyone with a special interest in administrative processes should read this book. Someone beginning to take an interest would do better to look at Polya's *How to solve it* and J. A. C. Brown's *Social Psychology of Industry*, and possibly proceed via the latter's *Freud and the Post-Freudians* and Stafford Beer's *Cybernetics and Management*.

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