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2. Biological Action of Ionizing Radiation. E. Lorenz, Laboratory of Biophysics NIH. Studies include biologic effects of radiation in laboratory animals, intermediary metabolism of essential amino acids, physiological effects including respiratory metabolism, molecular changes, pH changes, histopathologic studies, physics, dosimetry, radiobiology of radiation above the Mev energy, etc. \$200,000
3. Interrelationship of the Blood Clotting Mechanism and the Ability of the Reticuloendothelial System to Form Antibodies in Radiation Injury. H. G. Kupfer, Medical College of Va. \$ 8,138
4. Search for Substances and Methods to Raise the Resistance to Infection in Irradiated Animals. S. Marcus, University of Utah School of Medicine. \$ 6,750
5. Investigation of Factors Responsible for Radiation Protection by Post-Irradiation Parabiosis. M. Schneider, University of Texas Medical Branch. \$ 5,670
6. Exploration of the Ability of ACTH, Cortisone and Allied Substances to Modify Reactions to Ionizing Radiations in Humans. J. J. Nickerson, Sloan-Kettering Inst. \$ 43,150
7. Study of the Hemolytic Component of Post-Irradiation Anemia. C. Wright, Ohio State University School of Medicine. \$ 19,902
8. Nature of the Changes Induced in Living Cell by Irradiation. E. P. Kaufmann, Carnegie Institute. \$ 8,863
9. Factors Affecting Wound Healing, Including Effects of Irradiation on the Tensile Strength of Wounds. H. Bradshaw, Bowman Gray School of Medicine. \$ 2,403
10. Studies on Erythrocyte-antibody Reactions in Animals, Including Use of the Investigation of the Hemolytic Effect of Radiation. L. Young, University of Rochester. \$ 13,000
11. Medical Application of the Betatron. H. Quastler, Carle Foundation, Urbana, Illinois. \$ 9,720
12. Tumorigensis in Monkeys, Including the Effects of X-Rays Upon Ovarian Function in Monkeys Receiving 600 r Whole Body Irradiation. \$ 13,000
13. Hair and Skin Cycles as Related to Radiation and Chemical Treatment. H. B. Chase, Brown University. \$ 7,100

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BAW 113/1

14. Effects of Betatron Electron Beam on Bone and Cartilage. \$ 15,000
R. A. Harvey, University of Illinois College of Medicine.
15. Studies on Mechanism of Suppression and Stimulation of Normal Hematopoietic Tissue, Including Attempts to Reduce the Depressant Effect of Radiation on Blood Formation. \$ 21,486
L. Jacobson, University of Chicago.
16. Study of the Osteonecrosis Occuring in Bone After Local High Intensity Irradiation. \$ 6,976
P. DeBruyn, Univ. of Chicago.
17. An Investigation of Physical and Biological Properties and Long Term Therapeutic Effectiveness in Cancer of X-Rays Generated in the Range of 2 Mev. \$ 88,341
S. T. Cantril, Tumor Inst. of Swedish Hosp.
18. Experimental And Clinical Aspects of the Pathogenesis of the Acute Radiation Syndrome. \$ 11,718
S. Warren, NE Deconess Hospital, Boston, Massachusetts.
19. Clinical Investigation of a 22 Mev Betatron in the Treatment of Cancer. \$ 81,724
G. Fletcher, M. D., Anderson Hospital, Houston, Texas.
20. Design, Development and Testing of a Medical Linear Electron Accelerator for High Energy Radiation Therapy. \$ 38,126
E. L. Ginzton and H. S. Kaplan, Stanford University.
21. Effects of Betatron Radiation on the Eye. \$ 13,471
W. F. Hughes.

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- NM 007-088.06 Treatment of Burned Cases with ACTH and/or Cortisone.
U. S. Naval Hospital, San Diego, California.
- NM 007-090.05 Clinical Investigation to Devise Improved Parenteral Fluids to be Used as Blood Substitutes. U. S. Naval Hospital, Oakland, California.
- NM 007-090.06 Clinical Investigation of the Polysaccharides, Including Their Characteristics for Use as Plasma Substitute in Acute Blood Loss. U. S. Naval Hospital, Oakland, California.
- NM 007-090.15 Clinical Investigation of Oxypolygelatin as a Plasma Volume Expander. U. S. Naval Hospital, Oakland, California
- NM 007-093.01 Clinical Study of Dextranas a Plasma Substitute. U. S. Naval Hospital, Yokosuka, Japan.
- NR 102-000.005 Use of Dextran for Treatment of Shock. J. D. Myers, Duke University Medical School.
- NR 102-000.043 Effects of Dextran in Increasing Osmotic Pressure of Plasma. J. Humphry-Long, University of Pennsylvania School of Medicine.
- NR 102-000.060 Physiological Properties of Plasma Substitutes. J. M. Crimson, Stanford University School of Medicine.
- 21-53-007 Studies on Blood Plasma Substitutes.
- 21-1207-0005 Therapy of Ocular Burns.

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SUPPLEMENT I

PROJECTS IN SUBJECT FIELDS OF AW-6 BUT WHICH
ARE LISTED UNDER OTHER TECHNICAL OBJECTIVES

RADIATION

- NM 001-059.13 Some Conclusions and Calculations from the Present Day Knowledge of Cosmic Radiation with Regard to the Actual Radiation Exposure in High Altitude Flight. H. Shaeffer, School of Aviation Medicine, Pensacola, Florida.
- NM 001-059.18 Measurement of Radiation and Emanation Doses from Luminous Pain on Instrument Dials in Airplanes. School of Aviation Medicine, Pensacola, Florida.
- NM 001-059.23 Micropathological Studies of the Effects of Radiation from Internal Sources on Living Cells. School of Aviation Medicine, Pensacola, Florida.
- NM 001-059.25 The Effects of Exposure of Living Animals to Cosmic Radiation at Extremely High Altitudes. School of Aviation Medicine, Pensacola, Florida.
- NM 001-080 Early Effects of Small Amounts of Alpha Radiation (from Thorotrast) Upon Mammalian Cells. W. H. Sheldon, Emory University, Medical School.
- NM 007-090.12 Effect of Radiation on Antibody Production in the Human, Receiving Therapeutic Abdominal X-Ray. U. S. Naval Hospital, Oakland, California.
- NM 007-090.14 Effect of Radiation on Plasma Phospholipids in Humans, Receiving Therapeutic Abdominal X-Ray. U. S. Naval Hospital, Oakland, California.
- NM 007-018.12 Effects of Autogenous Blood and Plasma Transfusions Upon the Peripheral Blood Cell Population and the Hematopoietic Tissues of Rabbits Exposed to Total Body Irradiation. Naval Medical Research Institute, Bethesda, Maryland.

BURNS AND PLASMA VOLUME EXPANDERS

- NM 007-081.03 Investigation of Protective and Therapeutic Measures for Burns Occuring in the Naval Service. NMRI, Bethesda, Maryland.

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SUPPLEMENT II

ATOMIC ENERGY COMMISSION RESEARCH PROGRAMS IN THE SUBJECT FIELDS OF AW-6, EXCLUSIVE OF THE MAJOR SECTIONS OF THE BIOMEDICAL PROGRAM, RADIATION STUDIES:

BURNS

\$165,000

1. Physiological and Pathological Aspects of Thermal and Flash Burns. A. R. Moritz, Western Reserve University Medical School. \$30,000. This is a biochemical study of burned tissue.
2. Studies on Flash Burns. H. Pearce, University of Rochester School of Medicine. \$100,000.
3. Immunological Aspects of Skin Transplantation. F. W. Co Tui, Creedmore State Hospital, N. Y., and J. M. Converse, New York University, \$35,000

RADIATION

Summary not attempted. See Eleventh Semiannual Report AEC for unclassified contract research.

BLAST

\$125,000

1. Indirect Blast Injuries. W. R. Lovelace, J. Grossman, J. Hickman, C. S. White, R. Kniseley, and M. Halpern. Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico. Joint AEC and USAF support, \$100,000. This includes studies of (1) body displacement from overpressures, and (2) movement of missiles, contaminated and uncontaminated.
2. Blast Studies. S. Warren, UCLA Medical School. \$25,000. A shock tube is available for experimental studies on mice.

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SUPPLEMENT III

PUBLIC HEALTH SERVICE RESEARCH PROGRAM IN THE SUBJECT FIELDS OF LW-6*

<u>BURNS</u>	\$ 299,521
1. <u>Studies in Experimental Therapeutics and Pharmacology.</u> S. M. Rosenthal, NIH. This includes studies in the mechanism and therapy of experimental shock, including burn shock.	\$ 150,000
2. <u>Chemical Methods for the Removal of Devitalized Tissue from Burned Areas.</u> V. E. Siler, University of Cincinnati School of Medicine.	\$ 9,774
3. <u>Study of Effect of Adrenocorticotropic Hormone on the Course of Thermal Burns.</u> J. D. Martin, Emory University School of Medicine.	\$ 8,100
4. <u>Study of the Effects of Trauma, including Burns.</u> W. E. Abbott, Western Reserve University School of Medicine.	\$ 11,702
5. <u>Studies of Protein Metabolism in Burn Patients by Radioisotope Techniques.</u> T. G. Blocker, University of Texas School of Medicine.	\$ 20,000
6. <u>Experimental Histochemical Study of the Effects of Heat on Certain Extracellular Protein Complexes of the Skin.</u> A. R. Moritz, Western Reserve University School of Medicine.	\$ 5,292
7. <u>Changes in Intracellular Electrolytes in Surgical Patients, Including Burned Patients.</u> J. W. Baker, Harvard Medical School.	\$ 8,418
8. <u>Study of the Use of Sodium Salt Solutions in the Treatment of Burn Shock to Replace Stockpiling of Plasma.</u> J. N. Winfield, N. Y. Medical College, Flower and Fifth Avenue.	\$ 31,752
9. <u>Evaluation of Therapy in Surgical Shock with Radioactive Sodium, Including a Study of Shocked Dogs Undergoing Therapy with Saline Alone.</u> A. F. Burton, Howard University College of Medicine.	\$ 10,000

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2. Biological Action of Ionizing Radiation. E. Lorenz, Laboratory of Biophysics NIH. Studies include biologic effects of radiation in laboratory animals, intermediary metabolism of essential amino acids, physiological effects including respiratory metabolism, molecular changes, pH changes, histopathologic studies, physics, dosimetry, radiobiology of radiation above the Mev energy, etc. \$200,000
3. Interrelationship of the Blood Clotting Mechanism and the Ability of the Reticuloendothelial System to Form Antibodies in Radiation Injury. H. G. Kupfer, Medical College of Va. \$ 8,138
4. Search for Substances and Methods to Raise the Resistance to Infection in Irradiated Animals. S. Marcus, University of Utah School of Medicine. \$ 6,750
5. Investigation of Factors Responsible for Radiation Protection by Post-Irradiation Parabiosis. M. Schneider, University of Texas Medical Branch. \$ 5,670
6. Exploration of the Ability of ACTH, Cortisone and Allied Substances to Modify Reactions to Ionizing Radiations in Humans. J. J. Nickerson, Sloan-Kettering Inst. \$ 43,150
7. Study of the Hemolytic Component of Post-Irradiation Anemia. C. Wright, Ohio State University School of Medicine. \$ 19,902
8. Nature of the Changes Induced in Living Cell by Irradiation. E. P. Kaufmann, Carnegie Institute. \$ 8,863
9. Factors Affecting Wound Healing, Including Effects of Irradiation on the Tensile Strength of Wounds. H. Bradshaw, Bowman Gray School of Medicine. \$ 2,403
10. Studies on Erythrocyte-antibody Reactions in Animals, Including Use of the Investigation of the Hemolytic Effect of Radiation. L. Young, University of Rochester. \$ 13,000
11. Medical Application of the Betatron. H. Quastler, Carle Foundation, Urbana, Illinois. \$ 9,720
12. Tumorigenesis in Monkeys, Including the Effects of X-Rays Upon Ovarian Function in Monkeys Receiving 600 r Whole Body Irradiation. \$ 13,000
13. Hair and Skin Cycles as Related to Radiation and Chemical Treatment. H. B. Chase, Brown University. \$ 7,100

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- 10. Evaluation of Saline Therapy in Burns and Shock. A. Hurtado, \$ 16,983
Facultad de Medicina, Lima, Peru.
- 11. Study of Ther Preservation of the Blood, Formed Elements of the Blood, Blood Derivatives and Saline in Man and Animals. L. S. Haxtin, University of Pennsylvania School of Medicine. This includes the evaluation of saline in shock due to burns. \$ 27,500

RADIATION

\$1,072,820

A. Primate Studies

- 1. Minimal Radiation and Primate Behavior. T. C. Ruch, University of Washington. \$ 21,176
- 2. Effects of Ionizing Radiation on Subhuman Primates with Particular Attention to the Gastrointestinal Tract and the CNS. J. Z. Bowers, University of Utah School of Medicine. \$ 24,732
- 3. Physiological Effects of X-Radiation in Dogs and Monkeys. M. I. Gregersen, Columbia University. \$ 18,576
- 4. Effects of Total Body Irradiation on Subhuman Primates. C. A. Doan, Ohio State University School of Medicine. \$ 69,362
- 5. Performance and Histopathology of Monkeys as a Function of Lethal and Sublethal Radiation. R. T. Davis, University of South Dakota Medical School. \$ 7,587
- 6. Radiation and Brain (Monkeys). H. W. Wagon, University of California. \$ 45,573
- 7. Effects of X-ray Treatment on the Ovary of the Monkey. W. U. Gardner, Yale University School of Medicine. \$ 9,000
- 8. Effect of Ionizing Radiation on the Physiological Activity of the Nervous System in Adult and Fetal Mammals. L. B. Arey, Northwestern University Medical School. \$ 23,976

B. Others

- 1. Research in Nuclear Radiation Biology. H. L. Andrews, Laboratory of Physical Biology, NIH. Objective of this project is the determination of the significant mechanisms involved in the biological damage and related effects which result from high energy radiation. \$ 250,000

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| 14. | <u>Effects of Betatron Electron Beam on Bone and Cartilage.</u>
R. A. Harvey, University of Illinois College of Medicine. | \$ 15,000 |
| 15. | <u>Studies on Mechanism of Suppression and Stimulation of Normal Hematopoietic Tissue, Including Attempts to Reduce the Depressant Effect of Radiation on Blood Formation.</u>
D. Jacobson, University of Chicago. | \$ 21,486 |
| 16. | <u>Study of the Osteonecrosis Occuring in Bone After Local High Intensity Irradiation.</u> P. DeBruyn, Univ. of Chicago. | \$ 6,976 |
| 17. | <u>An Investigation of Physical and Biological Properties and Long Term Therapeutic Effectiveness in Cancer of X-Rays Generated in the Range of 2 Mev.</u> S. T. Cantril, Tumor Inst. of Swodish Hosp. | \$ 88,341 |
| 18. | <u>Experimental And Clinical Aspects of the Pathogenesis of the Acute Radiation Syndrome.</u> S. Warren, NE Deconess Hospital, Boston, Massachusetts. | \$ 11,718 |
| 19. | <u>Clinical Investigation of a 22 Mev Betatron in the Treatment of Cancer.</u> G. Fletcher, M. D., Anderson Hospital, Houston, Texas. | \$ 81,724 |
| 20. | <u>Design, Development and Testing of a Medical Linear Electron Accelerator for High Energy Radiation Therapy.</u>
R. L. Hinzman and H. S. Kaplan, Stanford University. | \$ 38,126 |
| 21. | <u>Effects of Betatron Radiation on the Eye.</u> W. F. Hughes. | \$ 13,471 |

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SUPPLEMENT IV

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RESEARCH BUDGETS IN THE FIELD OF AW-5*

	1951**	1952**	1953**	1954**
AW-5a Equipment and techniques for the detection, measurement, and evaluation of radioactivity.	3,594	3,572	3,729	3,142
AW-5b Equipment and techniques for the protection of personnel and material to minimize the hazards of atomic attack.	416	573	863	1,523
AW-5c Equipment and techniques for decontamination of radiologically contaminated personnel and material.	474	1,023	980	976

*Resources Division, RDB

** In Thousand Dollars

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6-59-12-024
(Contd)

- (18) Tissue Culture Studies. J. Szepsenwol, \$ 11,000
Emory University. A study of effects of plasma
expanders on growth of embryonic tissues in vitro.
- (19) Plasma Expanders. R. C. Warner, New York \$ 10,000
University. Develops analytical methods for measuring
the plasma expanders in body tissues, fluids,
urine, and determines the effect of plasma
expanders on reliability of standard methods for
blood analysis and for cell and plasma volume
determinations.
- (20) Plasma Expanders. F. D. Lawson, National \$149,295
Academy of Sciences. A central information office (1951)
for all phases of plasma expanders program has
been set up.
- (21) Effect of Polyvinylpyrrolidone on Protein \$ 13,486
Excretion. S. E. Bradley, Columbia University.
Study is measuring the effects of kidney functions
of a variety of types of PVP of different molecular
sizes to determine which types and molecular sizes
are excreted by the normal and nephrotic human kidney.
- (22) Physiological and Biochemical Studies with \$ 23,000
Plasma Expanders. The effect of various plasma sub-
stitutes including dextrans will be studied both in
animals and in patients. H. Egan, Washington U.,
School of Medicine.
- (23) Dextran. P. H. Maurer, University of Pitts- \$ 5,000
burgh. Antigenic properties of dextran will be
studied.
- (24) Plasma Expanders. S. M. Horvath, State Uni- \$ 10,000
versity of Iowa. Effects of plasma expanders and
polyglucose on cardiac output, liver blood flow,
renal functions, arterial and venous blood pressures,
blood volume, body water, body weight, appetite and
blood composition will be studied.
- (25) Dextran and Periston. T. S. Danowski, Uni- \$ 17,000
versity of Pittsburgh. Dextran and PVP will be
studied in animals which have salt depletion type
of shock and in patients with this and other shock
states. 12 and 24% dextran will also be studied.
- (26) Non-protein Colloid Solutions. J. Peters, \$ 4,000
Yale University. Studies the effect of plasma
expanders on excretion of water and electrolytes
in normal humans and in edematous patients.

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SUPPLEMENT II

ATOMIC ENERGY COMMISSION RESEARCH PROGRAMS IN THE
 SPECIAL FIELD OF AEC-6, EXCLUSIVE OF THE MAJOR
 SECTIONS OF THE BIOMEDICAL PROGRAM, RADIATION STUDIES:

BURNS) \$165,000

1. Physiological and Pathological Aspects of Thermal and Flash Burns. S. T. Horitz, Western Reserve University Medical School, \$50,000. This is a biochemical study of burned tissue.
2. Studies on Flash Burns. H. Pearce, University of Rochester School of Medicine, \$100,000.
3. Immunological Aspects of Skin Transplantation. F. W. Co Tui, Creedon State Hospital, N. Y., and J. M. Converse, New York University, \$35,000

RADIATION

Summary not attempted. See Eleventh Semiannual Report AEC for unclassified contract research.

BLAST) \$125,000

1. Indirect Blast Injuries. S. W. S. Lovelace, J. Grossman, J. Hickman, C. S. White, R. Kriseley, and M. Helporn. Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico. Joint AEC and USAF support, \$100,000. This includes studies of (1) body displacement from overpressures, and (2) movement of missiles, contaminated and uncontaminated.
2. Blast Studies. S. Warren, UCLA Medical School. \$25,000. A shock tube is available for experimental studies on mice.

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SUPPLEMENT III

PUBLIC HEALTH SERVICE RESEARCH PROGRAM
ON THE SUBJECT FIELDS OF AW-6*

<u>BURNS</u>	\$ 299,521
1. <u>Studies in Experimental Therapeutics and Pharmacology.</u> S. M. Rosenthal, NIH. This includes studies in the mechanism and therapy of experimental shock, including burn shock.	\$ 150,000
2. <u>Chemical Methods for the Removal of Devitalized Tissue from Burned Areas.</u> V. E. Siler, University of Cincinnati School of Medicine.	\$ 9,774
3. <u>Study of Effect of Adrenocorticotrophic Hormone on the Course of Thermal Burns.</u> J. D. Martin, Emory University School of Medicine.	\$ 8,100
4. <u>Study of the Effects of Trauma, including Burns.</u> W. E. Abbott, Western Reserve University School of Medicine.	\$ 11,702
5. <u>Studies of Protein Metabolism in Burn Patients by Radioisotope Techniques.</u> T. G. Blocker, University of Texas School of Medicine.	\$ 20,000
6. <u>Experimental Histochemical Study of the Effects of Heat on Certain Extracellular Protein Complexes of the Skin.</u> A. R. Moritz, Western Reserve University School of Medicine.	\$ 5,292
7. <u>Changes in Intracellular Electrolytes in Surgical Patients, Including Burned Patients.</u> J. W. Raker, Harvard Medical School.	\$ 8,418
8. <u>Study of the Use of Sodium Salt Solutions in the Treatment of Burn Shock to Replace Stockpiling of Plasma.</u> J. M. Winfield, N. Y. Medical College, Flower and Fifth Avenue.	\$ 31,752
9. <u>Evaluation of Therapy in Surgical Shock with Radioactive Sodium, Including a Study of Shocked Dogs Undergoing Therapy with Saline Alone.</u> A. F. Burton, Howard University College of Medicine.	\$ 10,000

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10. Evaluation of Saline Therapy in Burns and Shock. A. Hurtado, \$ 16,983
Facultad de Medicina, Lima, Peru.
11. Study of Ther Preservation of the Blood, Formed Elements of the Blood, Blood Derivatives and Saline in Man and Animals. I. S. Ravdin, University of Pennsylvania School of Medicine. This includes the evaluation of saline in shock due to burns. \$ 27,500

RADIATION

\$1,072,820

A. Primate Studies

1. Minimal Radiation and Primate Behavior. T. C. Ruch, University of Washington. \$ 21,176
2. Effects of Ionizing Radiation on Subhuman Primates with Particular Attention to the Gastrointestinal Tract and the CNS. J. Z. Bowers, University of Utah School of Medicine. \$ 24,732
3. Physiological Effects of X-Radiation in Dogs and Monkeys. M. I. Gregersen, Columbia University. \$ 18,576
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5. Performance and Histopathology of Monkeys as a Function of Lethal and Sublethal Radiation. R. T. Davis, University of South Dakota Medical School. \$ 7,587
6. Radiation and Brain (Monkeys). H. W. Magon, University of California. \$ 45,573
7. Effects of X-ray Treatment on the Ovary of the Monkey. W. U. Gardner, Yale University School of Medicine. \$ 9,000
8. Effect of Ionizing Radiation on the Physiological Activity of the Nervous System in Adult and Fetal Mammals. L. B. Arey, Northwestern University Medical School. \$ 23,976

B. Others

1. Research in Nuclear Radiation Biology. H. L. Andrews, Laboratory of Physical Biology, NIH. Objective of this project is the determination of the significant mechanisms involved in the biological damage and related effects which result from high energy radiation. \$ 250,000

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DOD RECC

SUPPLEMENT IV

BAW 113/1

RESEARCH BUDGETS IN THE FIELD OF AW-5*

		1951**	1952**	1953**	1954**
AW-5a	...equipment and techniques for the detection, measurement, and evaluation of radioactivity.	3,594	3,572	3,729	3,142
AW-5b	...equipment and techniques for the protection of personnel and material to minimize the hazards of atomic attack.	416	573	863	1,523
AW-5c	...equipment and techniques for decontamination of radiologically contaminated personnel and material.	474	1,023	980	976

*Resources Division, RDB

** In Thousand Dollars

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7 July 94
 RG 330, SECRETARY OF DEFENSE
 Entry 341, RESEARCH AND DEVELOPMENT
 BOARD RECORDS CONCERNING
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D. D. DECC

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6-59-12-024
(Contd)

- (18) Tissue Culture Studies. J. Szepsenwol, \$ 11,000
Emory University. A study of effects of plasma expanders on growth of embryonic tissues in vitro.
- (19) Plasma Expanders. R. C. Warner, New York \$ 10,000
University. Develops analytical methods for measuring the plasma expanders in body tissues, fluids, excreta, and determines the effect of plasma expanders on reliability of standard methods for blood analysis and for cell and plasma volume determinations.
- (20) Plasma Expanders. F. D. Lawrason, National \$149,295
Academy of Sciences. A central information office (1951)
for all phases of plasma expanders program has been set up.
- (21) Effect of Polyvinylpyrrolidone on Protein \$ 13,486
Excretion. S. E. Bradley, Columbia University. Study is measuring the effects of kidney functions of a variety of types of PVP of different molecular sizes to determine which types and molecular sizes are excreted by the normal and nephrotic human kidney.
- (22) Physiological and Biochemical Studies with \$ 23,000
Plasma Expanders. The effect of various plasma substitutes including dextrans will be studied both in animals and in patients. R. Elman, Washington U., School of Medicine.
- (23) Dextran. P. H. Maurer, University of Pitts- \$ 5,000
burgh. Antigenic properties of dextran will be studied.
- (24) Plasma Expanders. S. M. Horvath, State Uni- \$ 10,000
versity of Iowa. Effects of plasma expanders and polyglucose on cardiac output, liver blood flow, renal functions, arterial and venous blood pressures, blood volume, body water, body weight, appetite and blood composition will be studied.
- (25) Dextran and Periston. T. S. Danowski, Uni- \$ 17,000
versity of Pittsburgh. Dextran and PVP will be studied in animals which have salt depletion type of shock and in patients with this and other shock states. 12 and 24% dextran will also be studied.
- (26) Non-protein Colloid Solutions. J. Peters, \$ 4,000
Yale University. Studies the effect of plasma expanders on excretion of water and electrolytes in normal humans and in edematous patients.

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SECURITY INFORMATION

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